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ABSTRACT

The international community is becoming increasingly concerned with the impact of high adult mortality from Acquired Immune Deficiency Syndrome on the welfare of children, particularly on the welfare of orphans. Very little is known about the consequences of being an orphan in developing countries. This paper analyzes the relationship between orphan status, household wealth, and child school enrollment using data collected in the 1990s from 28 countries in Sub-Saharan Africa, Latin America, the Caribbean, and one country in Southeast Asia. The findings point to considerable diversity--so much so that generalizations are not possible. While there are some examples of large differentials in enrollment by orphan status, in the majority of cases, the orphan enrollment gap is dwarfed by the gap between children from richer and poorer households. In some cases, even children from the top of the wealth distribution have low enrollments, pointing to fundamental issues in the supply or demand for schooling that are a constraint to higher enrollments of all children. The gap in enrollment between female and male orphans is not much different than the gap between girls and boys living with parents, suggesting that female orphans are not disproportionately affected in terms of their enrollment status in most countries. These diverse findings demonstrate that the extent to which orphans are under-enrolled relative to other children is country-specific, at least in part because the correlation between orphan status and poverty is not consistent across countries. Social protection and schooling policies need to assess the specific country situation before considering mitigation measures. Country data sets and sample sizes, orphan rates, enrollment rates, and other statistics are appended. (Contains 21 references.) (SM)

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Poverty, AIDS and Children's Schooling: A Targeting Dilemma

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Contents

Abstract iii
1. Introduction 1
2. Country coverage, data, definitions, and methodology 2
   Source of data 4
   Definitions 4
3. Results 6
   How prevalent are orphaned children and with whom do they live? 6
   Are orphans more likely to be poor? 13
   Are orphans under-enrolled? 16
   Is the gender gap in enrollment larger for orphans? 22
4. Conclusions 27
References 29

Appendices

1. Data sets and sample sizes
2A. Orphan rates, ages 7-14
2B. Orphan rates, ages 15-17
3. Relationship to head among two-parent orphans, ages 7-14
4. Enrollment rates by orphan status and household wealth, ages 7-14
5. Changes in enrollment over time, by orphan status and household welfare
6. Enrollment rates by orphan status and household wealth, ages 15-17
7. Enrollment rates by orphan status and gender, ages 7-14

Tables

1. Poverty, schooling, and HIV/AIDS in the countries studied
2. Classification of countries by overall enrollment rates and difference in enrollment rates between orphans and non-orphans, most recent survey

Figures

1. Percent of children 7-14 with missing orphan status
2. Percent of children orphaned by age, Mozambique 1997
3. Percent of children 7-14 who are orphans, West Africa
4. Percent of children 7-14 who are orphans, Eastern and Southern Africa
5. Percent of children 7-14 who are orphans, Latin America and Asia
6. Relation between two-parent orphan rate and HIV infection
7. Percent of single-parent orphans living with the surviving parent, West Africa
8. Percent of single-parent orphans living with the surviving parent, Eastern and Southern Africa
9. Percent of single-parent orphans living with the surviving parent, Latin America and Asia
10. Percent of households with an orphan aged 7-14
11. Percent of the wealthiest and poorest households with an orphan aged 7-14
12. Percent of 7-14 year olds who are orphans
13. Relation between enrollment rates and HIV prevalence, countries surveyed since 1995
14. Enrollment differentials by orphan status, ages 7-14
15. Enrollment rate by orphan status in lowest and highest quintiles, Zambia 1998
16. Changes in enrollment rate by orphan status and wealth, Uganda 1995-2000
17. Changes in enrollment rate by orphan status and wealth, Kenya 1993-98
18. The gender gap in enrollment, all children
19. The gender gap in enrollment among orphans and non-orphans, selected countries
20. Gender differences in enrollment, orphans and non-orphans compared
21. Gender gap in enrollment for orphans and non-orphans in the poorest and richest of the sample

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Abstract

This paper analyzes the relationship between orphan status, household wealth, and child school enrollment using data collected in the 1990s from 28 countries in Sub-Saharan Africa, Latin America, the Caribbean, with one country in Southeast Asia. The findings point to considerable diversity—so much so that generalizations are not possible. While there are some examples of large differentials in enrollment by orphan status, in the majority of cases the orphan enrollment gap is dwarfed by the gap between children from richer and poorer households. In some cases, even children from the top of the wealth distribution have low enrollments, pointing to fundamental issues in the supply or demand for schooling that are a constraint to higher enrollments of all children. The gap in enrollment between female and male orphans is not much different than the gap between girls and boys with living parents, suggesting that female orphans are not disproportionately affected in terms of their enrollment in most countries. These diverse findings demonstrate that the extent to which orphans are under-enrolled relative to other children is country-specific, at least in part because the correlation between orphan status and poverty is not consistent across countries. Social protection and schooling policies need to assess the specific country situation before considering mitigation measures.

1. Introduction

Two decades into the AIDS pandemic, a cure for AIDS is still not at hand and the international community is becoming increasingly concerned with the impact of high adult AIDS mortality on child welfare, particularly on the welfare of orphans. In addition, many countries are suffering from civil unrest and post-conflict situations, resulting in war orphans and displaced children. AIDS and conflict are adding to an already elevated number of orphans from high adult mortality in developing countries.

While the number of affected children is potentially large, very little is known about the welfare consequences of being an orphan in developing countries, where poverty is widespread and human capital is low. One of the most frequently expressed concerns is that school-aged orphans will be forced to drop out of school or will never enroll, either because their guardians cannot afford the costs of schooling, the child is needed for income-generating or other economic activities, or the guardians simply have less interest in the welfare of children who are not their own (Foster and Williamson 2000, Nyambedha, Wandibba, and Aagaard-Hansen 2001, USAID 2000). This has prompted calls for governments to subsidize the schooling of orphans (Subbarao, Mattimore, and Plangemann 2001, USAID 2000, World Bank 2002a). Yet, to the extent that they drop out of school, orphans in the poorest countries will swell the ranks of an already large group of poor children who are not enrolled: In 1997, at least 67.5 million primary-aged children were not in school worldwide, of which 58 million were living in low-income countries, 31.5 million were living in South Asia and 25 million were living in sub-Saharan Africa (World Bank 2000).

The extent to which orphans are under-enrolled relative to other children and the reasons for non-enrollment have not been systematically reviewed. Most studies have focused exclusively on orphans with no comparison group of children with living parents, and in many cases analyze the hardest-hit orphans (e.g., Kitonsa and others 2000, Nyambedha, Wandibba, and Aagaard-Hansen 2001). It is not clear, for example, whether orphaned children are worse off than other equally poor children—therefore requiring a targeted intervention linked to their special needs—or whether the impact of becoming an orphan is to swell the already large group of poor or uneducated children.[1] In the latter case, one might argue for policies that will raise the levels of schooling of the unenrolled poor, orphan and non-orphan alike. In fact, there are reasons to believe that AIDS orphans may not be worse off than the poorest children and are possibly not as poor as other orphans. While adult mortality from other infectious diseases disproportionately affects the poor, AIDS strikes both the poor and the non-poor. Early in the African epidemic, the adults most likely to be infected were in fact those who were most mobile (traders, businessmen, fishermen, transport workers), not the poorest (World Bank 1999). Thus, orphan status alone may not be a good correlate of poverty or adverse outcomes.

This paper examines the relation between parental survival and two dimensions of welfare—poverty and school enrollment to answer the question of whether orphan status is a

1. An exception is the study by Lloyd and Blanc (1995), which uses a multiple regression model that controlled for living standards to predict enrollment of children 10-14 in seven African countries.

good predictor of lower welfare.[2] We use large and nationally representative datasets from 28 developing countries and four regions (Africa, Latin America, the Caribbean, and Asia) in a primarily descriptive exercise to examine the welfare correlates of orphan status among children 7-14 and, for a few countries where data permit, those aged 15-17. We anticipate that the impact of being an orphan on welfare will depend on many country-specific factors, including the overall poverty rate, the socioeconomic status of households that experience adult mortality, customs and demographic factors like child fostering and the extended family, existing demand for child schooling, and the public policies already in place. While we can't explore all of these explanatory factors, we expect that the results will demonstrate considerable diversity in the relation between being an orphan and welfare outcomes and therefore suggest diverse policy responses. This point is important in light of the current tendency to assume that the experience of the hardest-hit countries can be generalized to all countries hit by AIDS, and that there is a single, preferred policy solution based on that example.

The paper is organized into four major sections. Section 2 describes the datasets and define the key variables. Section 3 contains the findings on the following questions: (1) How prevalent are orphans and with whom do they live? (2) Are orphans more likely to be poor? (3) Are orphans less likely to be enrolled in school? (4)Is the gender gap in enrollment greater for orphans? Section 4 summarizes the results, identifying key policy issues and a future agenda for research.

We find considerable diversity in the relation between orphan status and poverty so much so that generalizations are not possible. While there are some examples of large differentials in enrollment by orphan status, in the majority of cases the size of the orphan enrollment gap is dwarfed by the gap in enrollment between children at the bottom and the top of the income distribution. In some cases, even children from the top of the income distribution have low enrollments, pointing to fundamental issues in the supply or demand for schooling that are a constraint to higher enrollments of all children, whether or not their parents are alive. When orphan enrollment gaps persist, even among the non-poor, these differences are very likely due to factors specific to being an orphan that cannot easily be addressed through polic ies on subsidizing school fees and uniforms. Finally, we find in most cases that the gap in enrollment between female and male orphans is not much different than the gap between girls and boys with living parents, suggesting that female orphans are not disproportionately affected in terms of their enrollment in most countries.

2. Country coverage, data, definitions, and methodology

The 28 countries in this study were selected based on data availability. They nevertheless achieve good geographic coverage within Sub-Saharan Africa and more limited coverage of Latin America, the Caribbean and a single country in Southeast Asia (Table 1).

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2. The enrollment rate captures only one dimension of schooling. Even if the enrollment rate were 100 percent, it does not tell us about attendance, repetition rates, completion rates, drop out rates, or the ultimate variables of interest, learning and achievement. These variables may also be affected by orphan status and poverty but they were not available for analysis.

Table 1. Poverty, schooling, and HIV/AIDS in the countries studied

Country	GNP/ capita 1998	Percent of the population living on less than $1/day		Gross primary enrollment ratio 1997	Adult HIV prevalence (%) 1999	Male adult mortality rate/1000 1998	Female adult mortality rate/1000 1998
		Year	Percent				
Western Africa							
Benin	380	..		78	2.45	367	308
Burkina Faso	240	1994	61.2	40	6.44	547	522
Cameroon	610	..		85	7.73	336	303
Central African Rep.	300	1993	66.6	..	13.84	576	488
Chad	230	..		58	2.69	454	388
Côte d'Ivoire	700	1995	12.3	71	10.76	526	513
Ghana	390	..		79	3.60	282	230
Guinea	530	..		54	1.54	404	404
Mali	250	1994	72.8	49	2.03	404	325
Niger	200	1995	61.4	29	1.35	453	352
Nigeria	300	1997	70.2	98	5.06	401	339
Senegal	520	1995	26.3	71	1.77	456	385
Togo	330	..		120	5.98	488	444
Eastern Africa							
Kenya	350	1994	26.5	85	13.95	442	418
Madagascar	260	1993	60.2	92	0.15	273	231
Tanzania	220	1993	19.9	67	8.09	521	482
Uganda	310	1992	36.7	74	8.30	579	615
Southern Africa							
Malawi	210	..		134	15.96	464	483
Mozambique	210	1996	37.9	60	13.22	408	364
South Africa	3,310	1993	11.5	133	19.94	282	194
Zambia	330	1996	72.6	89	19.95	521	545
Zimbabwe	620	1990-91	36.0	112	25.06	470	417
Latin America							
Brazil	4,630	1997	5.1	125	0.57	279	139
Guatemala	1,640	1989	39.8	88	1.38	297	195
Nicaragua	370	1993	3.0	102	0.20	208	139
Caribbean							
Dominican Republic	1,770	1996	3.2	94	5.07	153	96
Haiti	410	..		..	5.17	432	339
Southeast Asia							
Cambodia	260	..		113	4.04	357	309

Definitions: *Population living on less than $1/day*: Percent living at less than $1.08/day at 1993 international prices (corresponding to $1/day in 1985), with prices adjusted for purchasing power parity; *Gross primary enrollment ratio (GPER)*: primary enrollments as a percent of children of primary school age; *Adult HIV prevalence*: percent of adults 15-50 infected with HIV and alive; *Adult mortality rate*: number of people aged 15-60 per thousand who will die between the ages of 15-60 at the current age-specific mortality rates. The GPER can exceed 100 percent because of enrollment of over-age children.

Source: World Bank (2000), tables 1.1, 2.7, 2.10 and 2.18, and UNAIDS (2000).

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Twenty-four are low-income countries with GNP per capita of less than US$1,000. Among the low-income countries, the percent of the population living on less than one U.S. dollar per day, where measured, ranges from 12-73 percent. Gross primary enrollment ratios (GPER)—the number of children in primary school divided by the number of children of primary age? are also relatively low. Thirteen countries have GPER of less than 80 percent and only seven have ratios of more than 100 percent. Only 7 are "on track" to achieve the international goal of universal basic education by 2015, and 8 are "seriously off-track" to reach the goal (World Bank 2002b).

Levels of HIV infection are geographically concentrated, with the highest rates of 20 percent or more in Southern Africa and the lowest rates below 1 percent in Latin America. HIV is clearly a contributing factor to high levels of adult mortality in the hardest-hit countries, but not the only factor. Several countries have high adult mortality even with low HIV prevalence (for example, Guinea, Niger, and Mali) while countries like the Dominican Republic and South Africa have relatively lower adult mortality despite high HIV infection rates. Thus, AIDS is only one of several causes of the adult mortality that creates orphans; in some of the countries it is likely the major cause, while in others orphans are created by high levels of baseline adult mortality. It is also worth noting that in 24 of the 28 countries, men have higher mortality than women.

Source of data

We use datasets from 39 nationally representative household surveys dating from 1992–2000 that collected data on orphan status, school enrollment, and variables that measure household living standards. Thirty-four of the datasets are Demographic and Health Surveys (DHS) and five are Living Standards Surveys (see Appendix 1). Eight countries have a survey for more than one year, which permits analysis of trends in enrollment and orphan status. We analyze primarily children in the age group 7-14 because the DHS generally collects orphan status only for children under 15 and a lower boundary of seven years of age enhances cross-national comparability. To the extent that the children in this age group are enrolled, almost all would be enrolled in primary school. The total sample sizes for children 7-14 range from 5,000 - 24,500 but most are on the order of 5,000-10,000 (Appendix 1). All results are weighted to be nationally representative.

Definitions

Orphan. We consider three mutually exclusive types of orphan a child who has lost his/her mother only ("maternal orphan"), his/her father only ("paternal orphan"), or both parents ("two-parent orphan"). Because the data are from household surveys, institutionalized orphans or children not living in households are not included in this analysis. In addition, between 0 and 7 percent of children age 7-14 could not be classified according to their orphan status because respondents were not certain about the survival of at least one parent, usually the father (Figure 1).[3] For 18 of the countries, between 1-3 percent of the children had missing orphan status.

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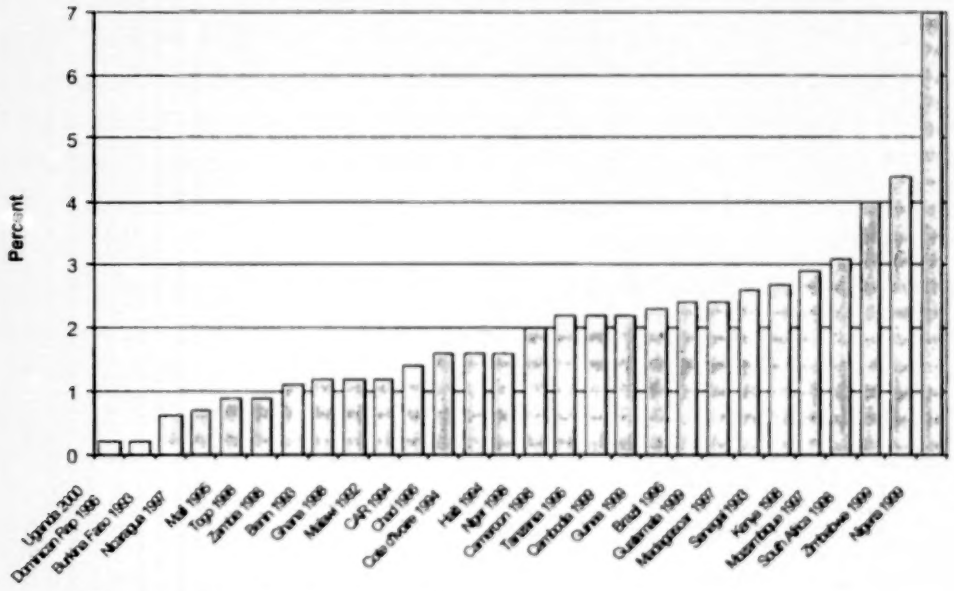
3. Excluding Nigeria, where 7 percent of children could not be classified, the range was between 0-4.4 percent. Sensitivity analysis was carried out on the missing orphans category. While the percentage of children

Figure 1. Percent of children 7-14 years old with missing orphan status



Source: Authors' calculations, DHS and LSMS datasets.

Enrollment. The enrollment rate is the percent of children aged 7-14 who are reported as currently "in school", irrespective of the grade in which they are enrolled. This enrollment rate cannot exceed 100 percent. Note that this is quite different from the Gross Primary Enrollment ratio, which can exceed 100 percent because older children who started late or repeated grades are included in the numerator. It is different from the Net Enrollment Rate since it does not take into account the grade attended.

Welfare/poverty. The DHS do not measure household consumption or income, but they do collect information on the ownership of assets and housing conditions, as do the living standards surveys we use. We have computed for every household a wealth index that is a continuous variable based on the factor loadings from the first component of a principal component analysis of asset ownership and housing characteristics:

- radio, refrigerator, television, bicycle, motorcycle, car
- source of drinking water, type of toilet facility
- electricity, number of rooms for sleeping, "finished" flooring or roofing.

We then assigned to every individual in each survey the wealth index for his/her household. Individuals were ordered from the lowest to the highest index in their country and, based on this, we defined quintiles of the wealth index across all individuals. Because of the problem with small cell sizes on two-parent orphans, we have aggregated children in the lowest 40 percent, the middle 40 percent, and the upper 20 percent of the wealth distribution based on the distribution

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who are orphans is affected, the average enrollment rates, or the distribution of orphans by household wealth is not substantially changed. Children with missing orphan status were not included in either the orphan or non-orphan enrollment rates reported here.

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of the population. The wealth index is used to place children relative to a given distribution of wealth within a country; it does not map easily into a typical poverty rate, which is usually based on an absolute level of welfare. The wealth index is defined within a country for a given survey; it cannot be compared in an absolute sense across countries or for different surveys in the same country.[4] The approach is described more fully in Filmer and Pritchett (2001) and is applied to the analysis of wealth gaps in education in Filmer and Pritchett (1999) and Filmer (2000).

3. Results

How prevalent are orphaned children and with whom do they live?

While the prevalence of orphans varies across countries, in all of them the share of children who are orphans increases with age. The pattern found in Mozambique is typical (Figure 2): orphans are relatively rare among pre-school children but rise to much higher levels among school-aged children. In addition, the percent of children who are paternal orphans generally exceeds the percent who are maternal orphans at all ages, in some countries by a factor of two or three. This reflects the higher age-specific mortality of men and the fact that women usually marry older men. The vast majority of orphans, therefore, have lost one parent. The share who have lost both parents is quite small, particularly in the pre-school age group. Among school-aged children (7-14) in the 28 countries and 39 datasets studied, the percent of children 7-14 who are two-parent orphans ranged from 0.2 percent (Dominican Republic) to a high of 4.5 percent (Uganda).

The small number of two parent orphans poses problems for comparing their welfare with other children. In the unweighted samples of children used in this study, there were fewer than 20 two-parent orphans aged 7-14 in 2 of the 39 datasets and in 9 other datasets there were fewer than 50. This becomes more of a problem when the samples are disaggregated by level of welfare. In 21 of the 28 countries, we couldn't compute the enrollment rate for 2-parent orphans in the richest quintile because there were fewer than 20 children who had lost both parents.

Aside from these common patterns in all developing countries, there are important differences across and within regions in the share of children who are orphans and the ratio of paternal to maternal orphans (Appendix 2). In West Africa, 4 to 10 percent of school-aged children are paternal orphans, roughly twice the proportion who are maternal orphans (Figure 3). Relatively few (1.6 percent or less) are two-parent orphans. Eastern and Southern African levels of paternal orphans are generally higher—6 to 13 percent—while maternal orphan rates are similar to West Africa (Figure 4). As a result, paternal orphan rates are 3 to 5 times higher than maternal rates. The reason for the much higher paternal orphan rate is not known; it could reflect the impact of the AIDS epidemic or higher male mortality from other causes in the region. An exception is Mozambique, which has the highest maternal orphan rate of any of the countries

4. In other words, a child with a value of the wealth index placing him/her in the lowest 40 percent of the distribution in country A, might not necessarily have the same level of welfare of a child in the lowest 40 percent of the distribution in country B. For countries with living standards surveys, the ranking of children by this 40/40/20 distribution was compared, using measures of household consumption per adult and the wealth index. There is substantial overlap in the group classifications, and enrollment rates across groups are very similar when using the different methods to rank individuals. In countries where consumption was available we nevertheless used the wealth index for consistency.

studied, nearly 7 percent. With the exception of three countries—Zambia, Zimbabwe, and Uganda—the two-parent orphan rate in East Africa is under 2 percent. Finally, in Latin America, the Caribbean and Cambodia, all orphan rates are substantially lower (4-5 percent paternal, 1-2 percent maternal and 1 percent or less two parent orphans). A notable exception is Haiti, where the pattern and level are closer to those found in West Africa.

Figure 2. Percent of children orphaned by age, Mozambique 1997

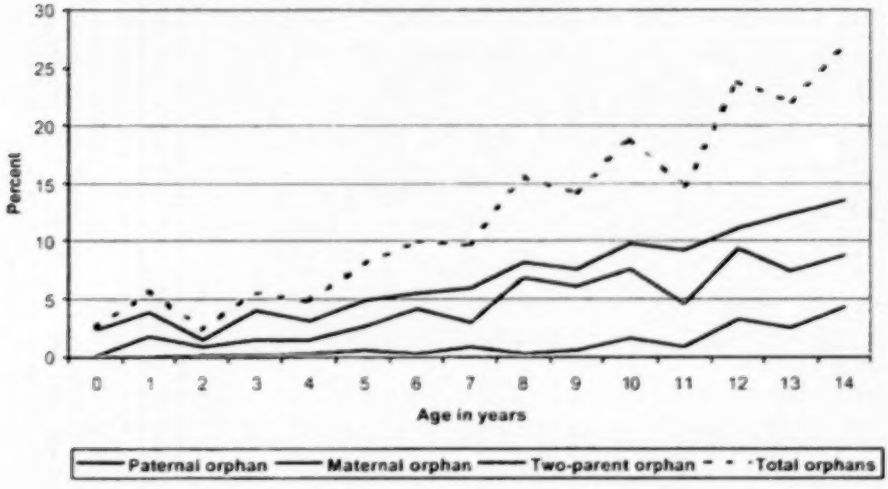


Figure 3. Percent of children 7-14 who are orphaned, West Africa

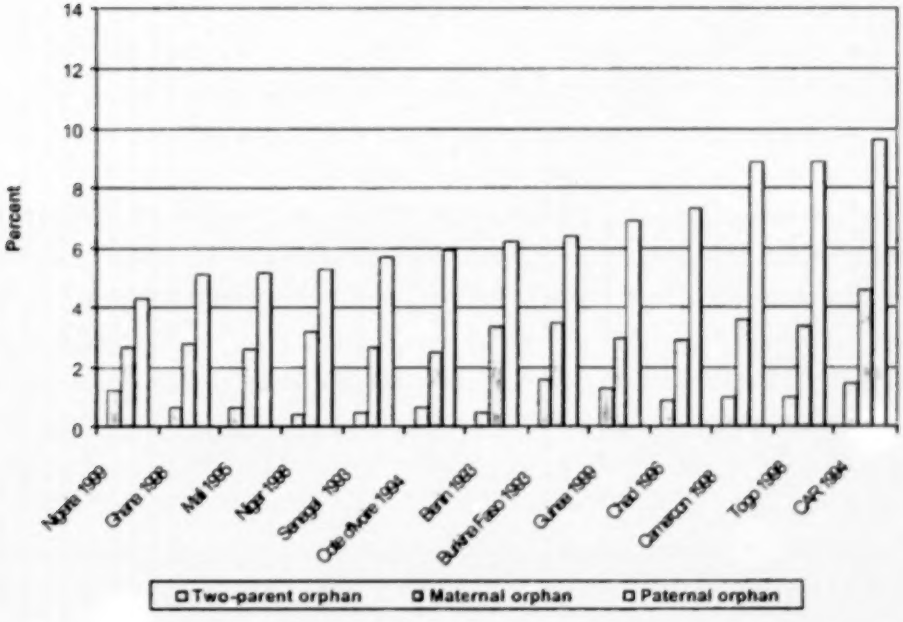


Figure 4. Percent of children 7-14 who are orphans, Eastern & Southern Africa

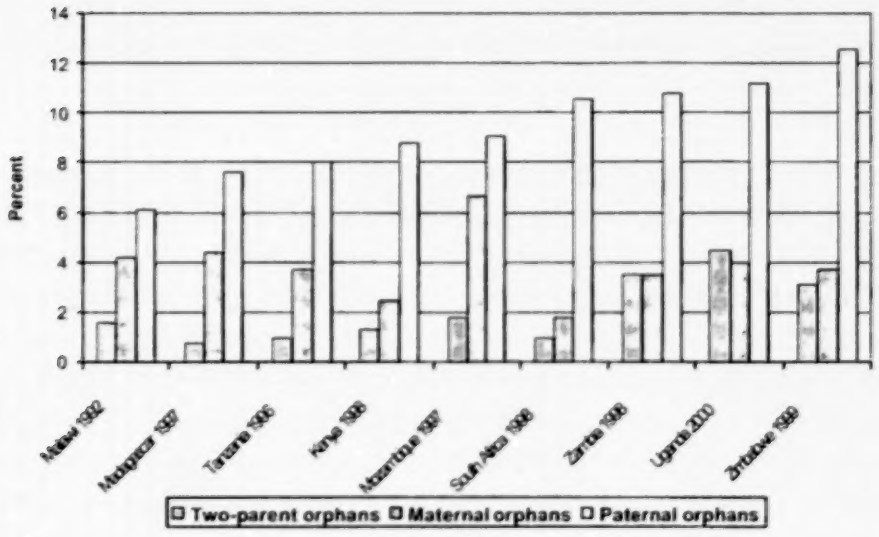
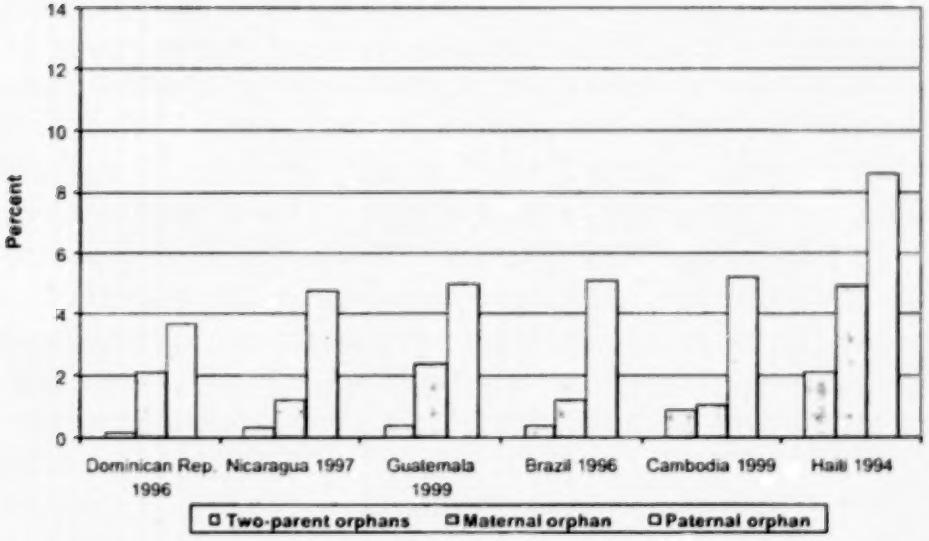


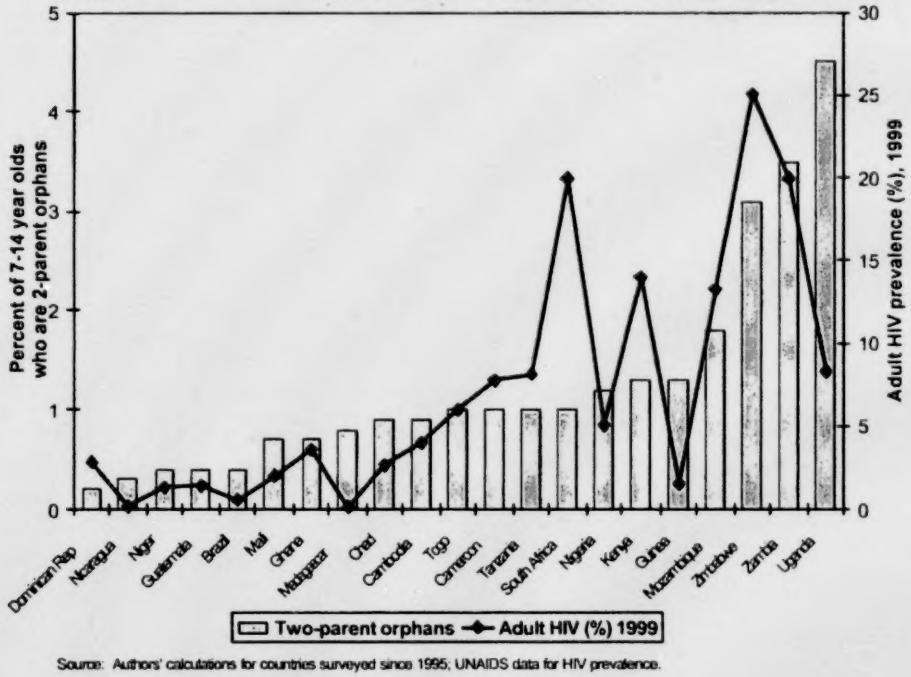
Figure 5. Percent of children 7-14 who are orphans, Latin America and Asia



What accounts for the variation in orphan rates? There is generally a positive correlation between orphan rates and HIV prevalence (the percent of people living with HIV), but with a great deal of variation (Figure 6). This is because orphan rates are affected by AIDS through *cumulative AIDS deaths*, while HIV prevalence is a measure of the percent of the population that is infected and still alive. Because of the long asymptomatic period between HIV infection and

AIDS mortality, countries where HIV has increased rapidly and recently may have high HIV prevalence but low AIDS mortality and therefore only a small impact on orphan rates (e.g., South Africa). In countries with mature epidemics, HIV prevalence may have declined or stabilized in part because of high mortality rates (e.g., Uganda). Thus, the percentage of children orphaned may be high even though HIV prevalence has declined. Moreover, orphan rates also reflect adult mortality from causes other than AIDS (occupation-related, war-related, maternal causes).

Figure 6. Relation between two-parent orphan rate and HIV infection



Source: Authors' calculations for countries surveyed since 1995; UNAIDS data for HIV prevalence.

Pursuing this point further, a regression of the two-parent orphan rate for the 28 countries in Table 1 on the HIV infection rate in 1999 and the 1998 female adult mortality rate (amr) reveals the following result (t-statistics in parentheses, adjusted $R^2 = .5014$)

(1) Two-parent orphan rate = 0.055 * [1999 HIV rate] + 0.0037 * [1998 female amr].
(2.49) (3.26)

We would expect that the HIV infection rate contributes to the 2-parent orphan rate *through* the adult mortality rate, but when we control for HIV infection, the adult mortality rate (net of the influence of HIV) is still significantly associated with the orphan rate, indicating that there is substantial adult mortality not accounted for by the contemporaneous HIV infection rate. At the mean values for this 28-country sample, a 1 percent proportionate increase in HIV infection (from 7.4 to 7.5 percent) is associated with an increase of 0.32 in the two-parent orphan rate, while a 1 percent proportionate increase in the female adult mortality rate (from 356

to 359) is associated with an increase in the mean two-parent orphan rate of 1.05 (the mean two-parent orphan rate in the 28 countries was 1.26 percent). When HIV is not controlled for (results not shown here), a 1 percent proportionate increase in the adult mortality rate is associated with an increase of 1.38 percent in the two-parent orphan rate.

Another way of gauging the contribution of the AIDS epidemic to the orphan rates is to compare orphan rates over time, before and after the AIDS epidemic. Unfortunately, data are not available for the orphan rate for both maternal and paternal orphans for school-aged children (7-14) before the AIDS epidemic. However, the share of *children 0-14* who had lost their *mothers* or *both parents* was about 2 percent in East Africa before the AIDS epidemic? 1.91 percent in Kenya and 2.44 percent in Uganda in the 1969 censuses and 2.23 percent in Tanzania in the 1978 census (World Bank 1999). The rate in Kenya was basically unchanged as of the 1993 DHS (1.8 percent) but had risen by 50 percent (to 2.7 percent) in the1998 DHS. In Tanzania, the maternal and two-parent orphan rate for children 0-14 actually declined between the 1978 and 1988 censuses (to 1.96 percent) before rising by 40 percent (to 2.8 percent) by the time of the 1994 DHS. In Uganda the rate had doubled by 1995 (to 5 percent) and reached 5.7 percent by the 1999/2000 National Household Survey (a 130 percent increase since 1969). Thus, in these three East African countries, the maternal and two-parent orphan rates have risen by 40-130 percent since the onset of the AIDS epidemic. We have no information on the pre-AIDS orphan rates in similar age groups for other regions of Africa or the world, but they would have reflected the prevailing adult mortality rates due to other causes.

In the most recent surveys for the 28 countries in this study, most orphans aged 7-14 are single-parent orphans and most single-parent orphans live with the surviving parent (Figures 7-9). In West Africa, between 50 and 75 percent live with the surviving parent and this is roughly the same for paternal and maternal orphans. Interestingly, a relatively high proportion of maternal orphans live with their father. In East Africa, in all but Madagascar and Zambia, paternal orphans are much more likely to live with their mother compared to West Africa, and maternal orphans are much less likely to live with their father. It is unclear why. In Nicaragua, Guatemala, Cambodia, and Brazil, 80-90 percent of paternal orphans live with their mother. Nicaragua and Haiti seem to have a pattern similar to Eastern and Southern Africa, while the Dominican Republic has a pattern similar to that in West Africa.

Figure 7. Percent of single-parent orphans living with surviving parent, West Africa

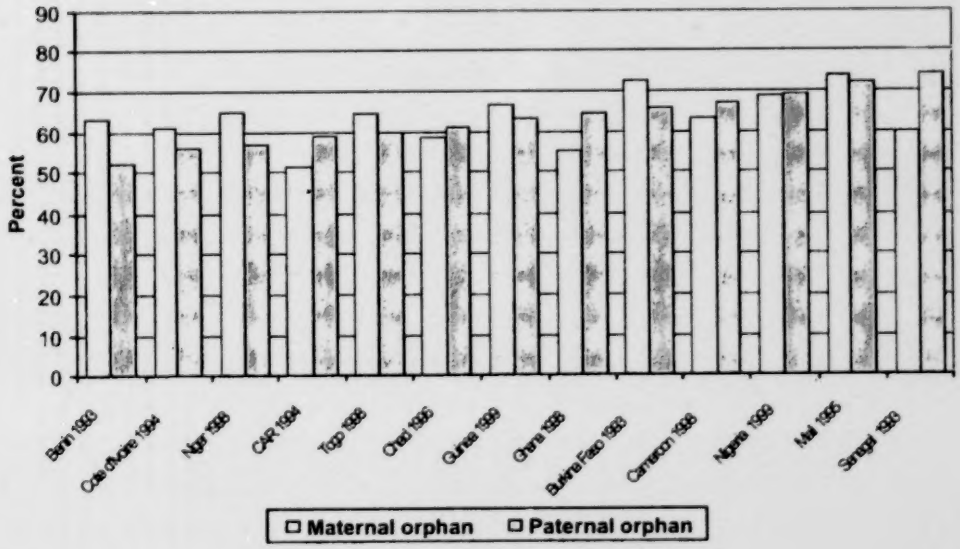


Figure 8. Percent of single-parent orphans living with surviving parent, Eastern and Southern Africa

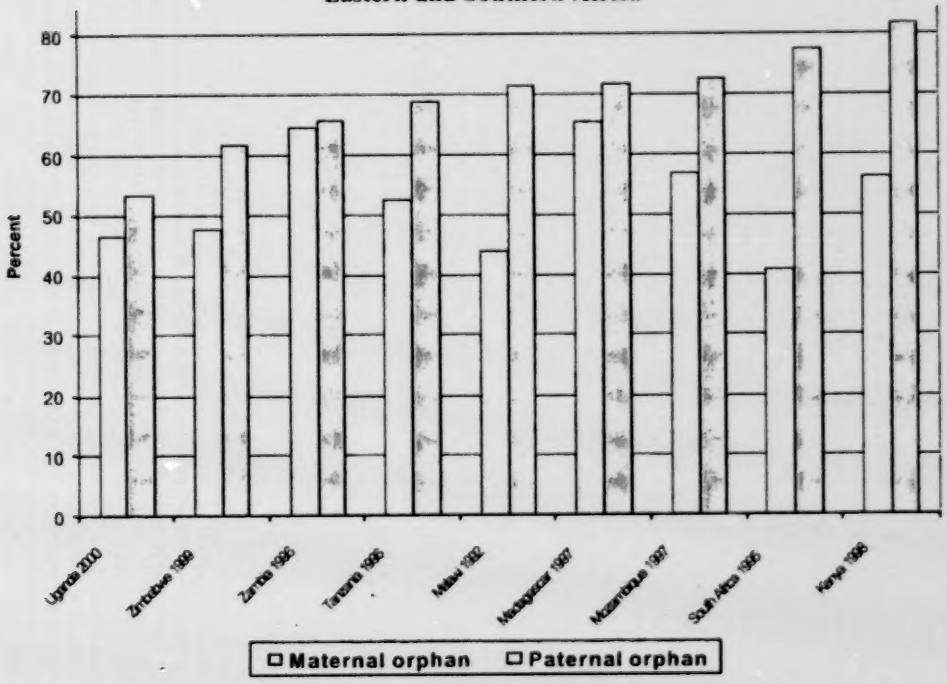
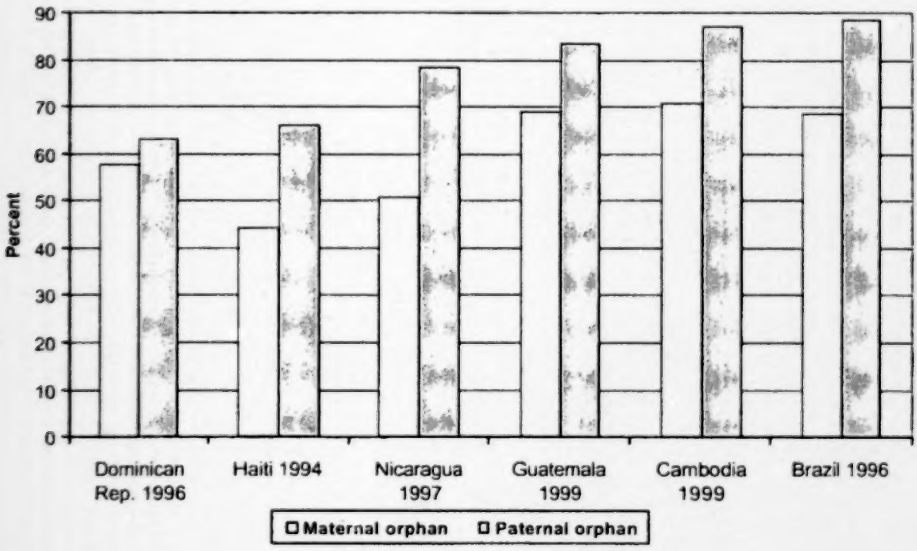


Figure 9. Percent of single-parent orphans living with the surviving parent, Latin America and Asia



Where an orphan lives is likely to be influenced by available alternatives. For example, in West Africa, and to a lesser extent in East Africa, child fostering within the extended family is relatively common, and thus single-parent orphans are less likely to live with a surviving parent. By contrast, in Cambodia, where previous regimes demolished the extended family structure, orphans may have no choice but to live with a surviving parent. The large degree of mobility among men engaged in mining in Southern Africa may explain why so few maternal orphans live with their fathers. These are all hypotheses that warrant investigation to fully understand the reasons for and welfare consequences of these observed patterns of living arrangements.

Most of the household surveys collected information on the relation of every child to the head of the household. Two parent orphans, by definition, are not living with their parents but usually are living with a relative (Appendix 3).[5] Unfortunately, interpretation of the results of the "relation to head" question in these surveys is complicated by the fact that "adopted/foster child" was included as a category in nearly all of them and it is not mutually exclusive with the other categories. Many of the "adopted/foster" children of the head may be the grandchild, sibling or niece or nephew of the head, while it is probable that many of the two-parent orphans living with other relatives have effectively been adopted, if not formally. Further, foster and adopted children were recorded in a single category, yet the two terms often have different meanings, with fostering being a temporary situation and adoption being permanent, and fostering frequently occurring between families of relatives (e.g., Ainsworth 1996). This category probably was likely defined and interpreted in the cultural context of each country and probably

5. Note that the number of two-parent orphans aged 7-14 in these samples ranged from fewer than 20 in the Dominican Republic to more than 700 in Zambia (1998). In 25 of the datasets there were fewer than 100.

not strictly comparable across countries. If we assume that most children in the "adopted/foster child" category are in fact related to the head (probably a good assumption in the African countries, at any rate), then at least 90 percent of two-parent orphans in 28 of the 36 datasets for which information is available were living with relatives. The notable exceptions are in Haiti, Guatemala, Madagascar, Benin, Brazil, and Senegal, where from 12-26 percent of two parent orphans of primary school age (7-14) were not related to the head of household. Because of the overlap between 'adopted/foster' and other categories, the percent of children listed as living with a grandparent should be interpreted as a lower bound. With this in mind, at least half of two parent orphans in Guatemala, Malawi, Nicaragua, and Zimbabwe were living in grandparent-headed households and at least 40 percent in South Africa and Uganda. In most countries, at least 10 percent of two parent orphans aged 7-14 lived in a household headed by a sibling. It was extremely rare for two-parent orphans in this age group to be listed as the household head (only 4 countries registered any cases), although it is possible that the DHS (with the main objective of interviewing adult women) may have excluded households comprising only children in some countries (Bicego, Rutstein, and Johnson 2002).[6] However, systematic investigations in several countries have confirmed that child-headed households are rare (Ainsworth, Ghosh and Semali 1995, Gilborn and others 2001).

Are orphans more likely to be poor?

The relation between orphan status and poverty can be viewed from the perspective of whether poor or non-poor households are more likely to have resident orphans or whether orphans are more likely to live in poor or non-poor households compared with non-orphans. There are at least two reasons why non-poor households may be more likely to have orphaned children than poor households; first, the orphan's parents may have been from among the non-poor and, second, orphans may be sent to the homes of relatives most capable of caring for them.[7]

Figure 10 shows the percent of households with an orphan aged 7-14 in the most recent survey for each of the 28 countries. With the exception of two outliers (Zambia and Uganda, with 16.5 and 19.7 percent of households with orphans, respectively), between 4 and 13 percent of households have a school-aged orphan. This is an enormous range, affected not only by adult mortality from AIDS and other causes, but also the extent to which orphans are concentrated in a few households or distributed over a larger number of households. The extent of institutionalization of orphans could also be a factor reducing the share of households with an orphan, although we have no information on the percent of children who are in orphanages in these countries.

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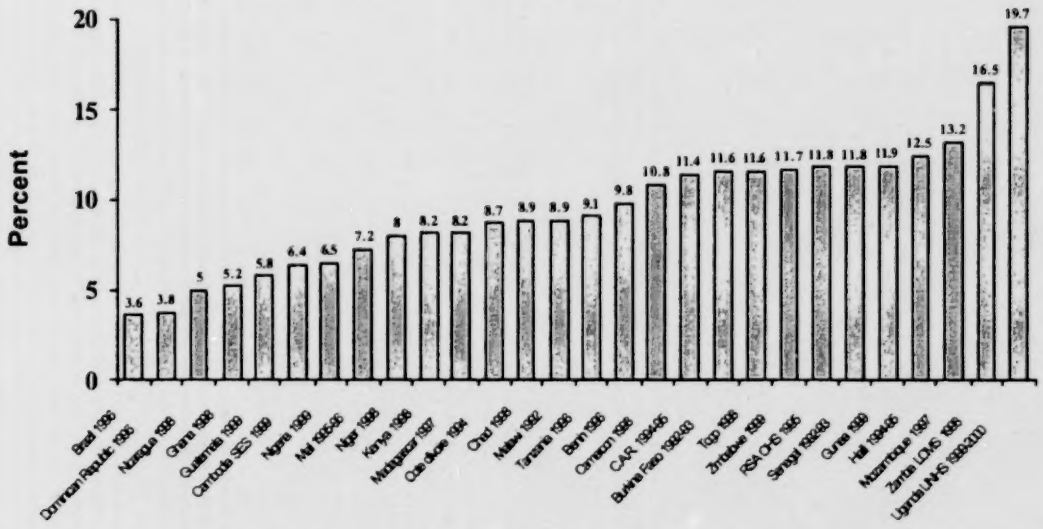
6. An alternative explanation might be that two parent orphans who head households are in that role for a very short time before they are absorbed by the extended family.

7. Ainsworth, Beegle, and Koda (2002) find that the deceased parents of orphans had roughly one more year of schooling, on average, than did the living parents of non-orphans in the Kagera region of Tanzania in the early 1990s. Gilborn and others (2001) find that current and prospective guardians of orphans had higher socioeconomic status than parents living with AIDS in Luwero and Tororo Districts of Uganda.

Figure 10. Percent of households with an orphan aged 7-14



If a program were to target interventions to households with resident orphans, would it be channeling resources to the poorest households? In Figure 11, we plot the share of the richest 20 percent of households with an orphan 7-14 (on the y-axis) against the share of the poorest 40 percent of households with an orphan (on the x-axis). A 45-degree line from the origin indicates the points where exactly the same share of households in the poor and non-poor have orphans. In countries located above the 45-degree line non-poor households are more likely than poor households to have an orphan; in countries below the line poor households are more likely to have an orphan. These results show that, poor households are equally likely to have an orphan as non-poor in 9 cases. In 10 cases, poor households were more likely to have an orphan than were non-poor households (e.g., Senegal, Zimbabwe, Cambodia) , and in 9 cases non-poor households (the top 20 percent) were more likely to have an orphan. In Uganda in 1999/2000, for example, 17 percent of the poorest 40 percent of households had an orphan, while 23 percent of the households in the highest fifth of the welfare distribution had an orphan. In contrast, in South Africa in 1995 poor households were three times more likely to have an orphan than were non-poor households (nearly 15 percent of the poorest households had an orphan compared to only about 5 percent of the least poor households).

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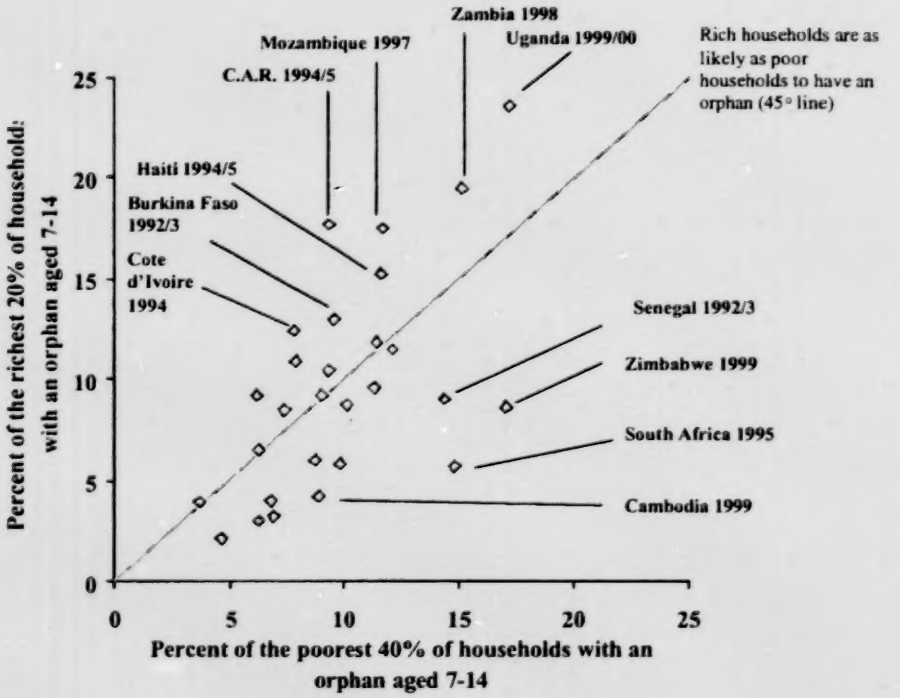
Figure 11. Percent of wealthiest and poorest households with an orphan aged 7-14

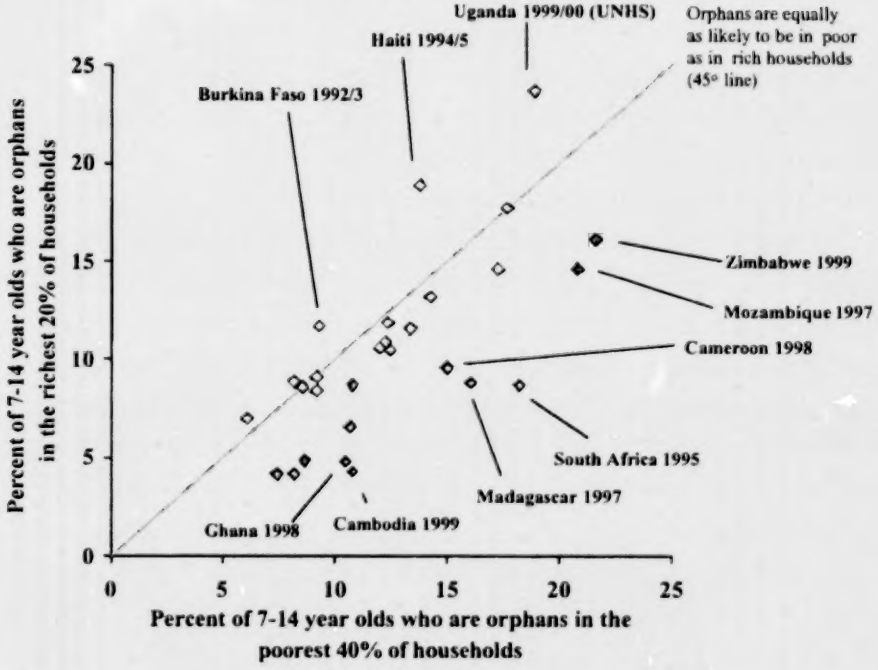


Note: Solid symbol indicates that the difference between rich and poor households is significant at 10 percent level

Figure 11 speaks to the distribution of households according to whether they have an orphan, but not the distribution of orphans across households. Both poor and non-poor households could have equal probabilities of having an orphan, but poor households could have a greater number per household. Figure 12 show the orphan rate (the percent of children who are orphans) in the poorest 40 percent and richest 20 percent of households, using the wealth index. Along the 45-degree line, the share is equal; above the line non-poor households have a higher orphan rate and below the line poor households have a higher orphan rate. The data points with open circles indicate that the difference in orphan rates between the two groups was not statistically significant. In 16 of the 28 countries for the latest year there is no statistically significant difference in the orphan rates for poor and non-poor households. In Uganda and Haiti—both of which are heavily hit by the AIDS epidemic —the orphan rate in non-poor households seems substantially higher than in poor households, but the results are not statistically significant.[8] On the other hand, for 12 countries poor households have higher orphan rates than non-poor households and in a few countries this is large. In particular, we see that many of the same countries where poor households are more likely to have an orphan, they also have higher orphan rates, for example, South Africa, Cambodia, and Zimbabwe.

8. Bicego, Rutstein, and Johnson (2001) found, similarly, that double orphans in the age group 0-14 were less likely than non-orphans to be living in poor households in Niger, Kenya, and Tanzania, using DHS data.

Figure 12. Percent of 7-14 year olds who are orphans



Note: Solid symbol indicates that the difference between rich and poor households is significant at 10 percent level

In summary, orphans live in both poor and non-poor households. Households with orphans are not necessarily the poorest households, and in some countries the poorest households are *less* likely to have orphans because of the natural coping processes in which those with the most resources take in orphaned children or because of the socioeconomic distribution of HIV infection. In more than half of the countries in this study, children in poor families are no more likely to be orphans than are children in non-poor families, while in the remainder poor children are more likely to be orphans.

Are orphans under-enrolled?

The countries most affected by the AIDS epidemic in Sub-Saharan Africa have among the lowest enrollment rates in the world. Estimates are that by 2015 half of countries in sub-Saharan Africa will not reach the Education for All goals.[9] In a quarter of the 28 countries

9. The Education for All goals are (1) expanding and improving comprehensive early childhood care and education, especially for the most vulnerable and disadvantaged children; (2) ensuring that by 2015 all children, particularly girls, children in difficult circumstances and those belonging to ethnic minorities, have access to and complete free and compulsory primary education of good quality; (3) ensuring that the learning needs of all young people and adults are met through equitable access to appropriate learning and life skills programmes; (4) achieving a 50 per cent improvement in levels of adult literacy by 2015, especially for women, and equitable access to basic and continuing education for all adults; (5) eliminating gender disparities in primary and secondary education by 2005, and achieving gender equality in education by 2015, with a focus on ensuring girls' full and equal access to and achievement in basic education of good quality; (6) improving

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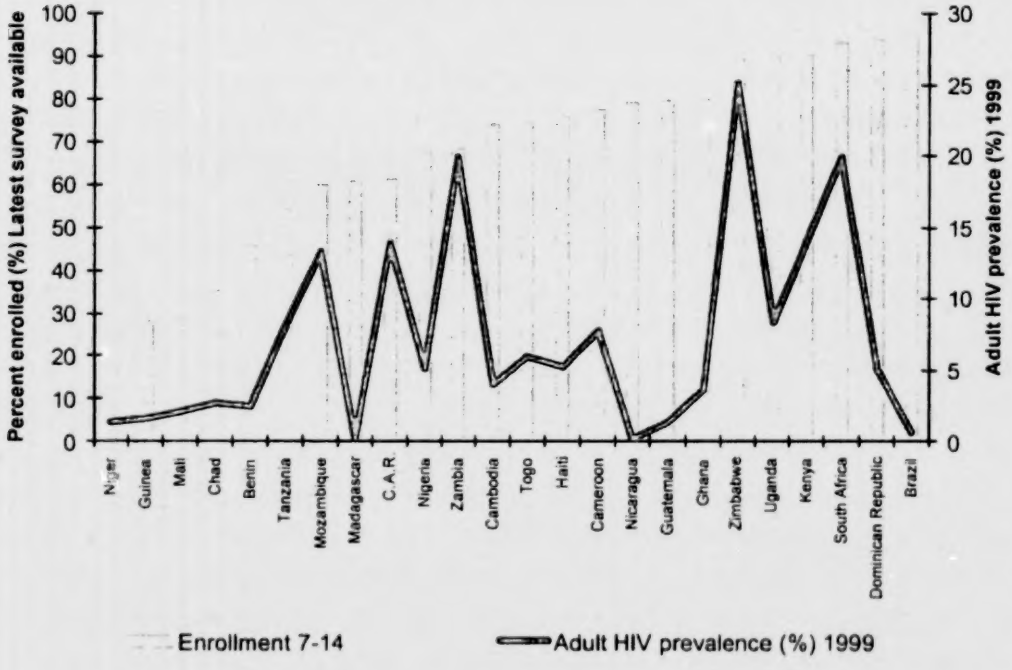
studied, fewer than 50 percent of 7-14 year olds are enrolled in school in the most recent household survey. In about half, 50-80 percent are enrolled and in the remaining quarter, enrollment exceeds 80 percent. Aggregate enrollment rates are affected by many economic and policy factors governing the supply and demand for education as well as labor market conditions that are only indirectly affected by the AIDS epidemic, so it is not surprising that there is no correlation between adult HIV prevalence and enrollment across countries (Figure 13). Nevertheless, within countries and particularly in those hardest hit by AIDS or conflict, policymakers are concerns that orphans may be under-enrolled. [10] If true, then the growing number of orphans might pose special challenges for achievement of education for all at the national level and may lead to lower human capital and greater poverty among orphans when they reach adulthood.

Figure 13. Relation between enrollment rates and HIV prevalence, countries surveyed since 1995



all aspects of the quality of education and ensuring excellence of all so that recognized and measurable learning outcomes are achieved by all, especially in literacy, numeracy and essential life skills (UNESCO 2002). The Millennium Development Goals set precise targets for completion and gender equity: (1) ensure that, by 2015, children everywhere, boys and girls alike, will be able to complete a full course of primary schooling; and (2) that girls and boys will have equal access to all levels of education (United Nations 2002).

10. Even if not under-enrolled, orphans could be disadvantaged in terms of hours of attendance and ultimately achievement and learning outcomes because of lower investments in complementary inputs (health care, text books), greater demand for their time in economic activities, lack of parental attention, and psychological stress.

Are orphans of primary school age (7-14) less likely to be enrolled in school than children with living parents? Population-weighted enrollment rates for children by orphan status for all 39 datasets and 28 countries are presented in Appendix 4. Tests of statistical significance of the enrollment rate of each category of orphan compared with children with two living parents are presented. These tests are useful, but it is often the case that the sample size was very small for two-parent orphans resulting in a lack of significance for what appears to be large differentials or that two rates are highly statistically significant from a large sample size but the size of the differential is small.

The results show substantial heterogeneity in terms of enrollment differentials among orphans and non-orphans in the 28 countries with very different overall levels of enrollment among children with living parents. For example, in both Chad (with overall enrollment rates of less than 40 percent) and South Africa (with overall enrollment rates greater than 90 percent) we see no significant difference in enrollment between orphans and children with living parents (Figure 14, panel A). In contrast, in both Benin and Kenya single- and two-parent orphans all have lower enrollment rates than children with living parents (Figure 14, panel B). The overall enrollment rate for children with living parents in Kenya is nearly twice that of Benin. In Burkina Faso and Haiti, maternal orphans and two-parent orphans are disadvantaged in terms of enrollment, while in Tanzania and Nigeria orphans have *higher* enrollment than children with living parents (Figure 14, panels C and D). The situation in all 28 countries is summarized in Table 2 according to the overall 7-14 enrollment rate.

Figure 14. Enrollment differentials by orphan status, ages 7-14

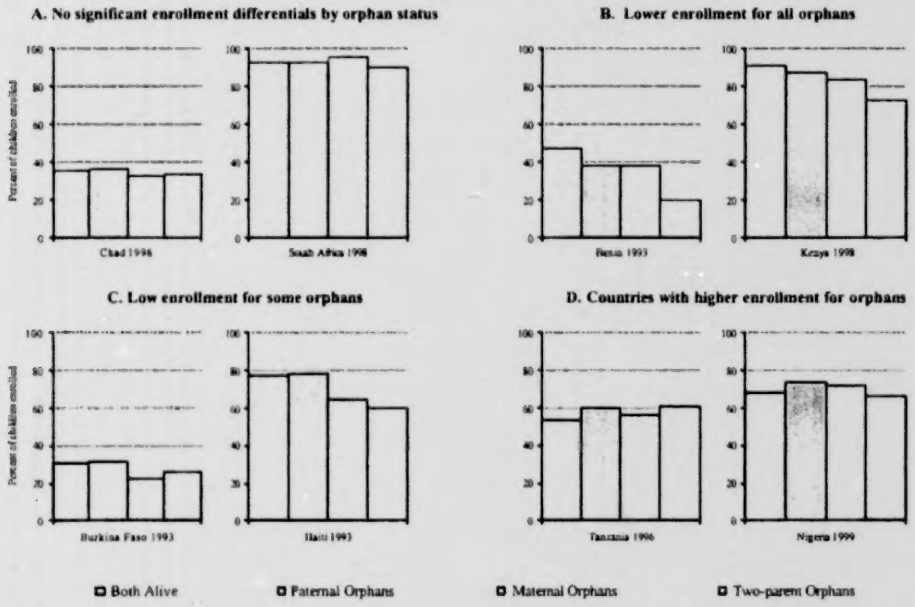


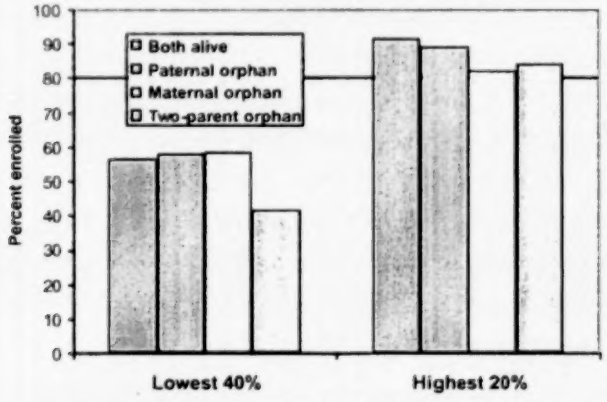
Table 2. Classification of countries by ove rall enrollment rates and difference in enrollment rates between orphans and non-orphans, most recent survey

Orphan enrollment relative to children with living parents	*Mean enrollment rate for children 7-14*		
	Low (<50%)	*Medium (50-80%)*	*High (>80%)*
Lower enrollment			
All orphans	Benin 1996	Cambodia 1999 CAR 1994/5 Côte d'Ivoire 1994 Guatemala 1999 Madagascar 1997 Malawi 1992 Nicaragua 1997/8	Brazil 1996 Kenya 1998
Maternal and 2-parent orphans	Burkina Faso 1992/93	Cameroon 1998 Haiti 1994/5	Zimbabwe 1999
Maternal orphans only	Guinea 1999		Dominican Republic 1996*
Paternal and 2-parent orphans	Senegal 1992/93	Togo 1998	Ghana 1998
Paternal orphans only			Uganda 1999/00
Only 2-parent orphans		Mozambique 1997 Zambia 1998	
Equally likely to be enrolled			
	Chad 1996/97 Mali 1995/96 Niger 1998		South Africa 1998
Higher enrollment			
		Nigeria 1999 Tanzania 1996	

* Enrollment rates could not be computed for two-parent orphans because there were fewer than 20 children.

One possible explanation for these observed differentials is the correlation between poverty and orphan status. Of the 28 countries, 25 have large differences in enrollment rates between children from the poorest and wealthiest families (see Appendix 4). Orphan enrollment may be lower in some cases because orphans are more likely to be poor. If we control for the effects of poverty, do differences in enrollment by orphan status persist? In Figure 15 we show the enrollment rate by orphan status for the lowest 40 percent and highest 20 percent of the wealth distribution in Zambia. Within the poorest and richest households, orphans are less likely to attend school but particularly among the poor. Reasons for this "orphan effect" may include a greater demand placed on children's time at home; grief that prevents a child from attending school; or other factors. However, the greatest differentials in school enrollments are between the poor and the non-poor, including orphans in these groups. Many of the reasons that poor orphans are not in school are the same as those that prevent other poor children from attending.

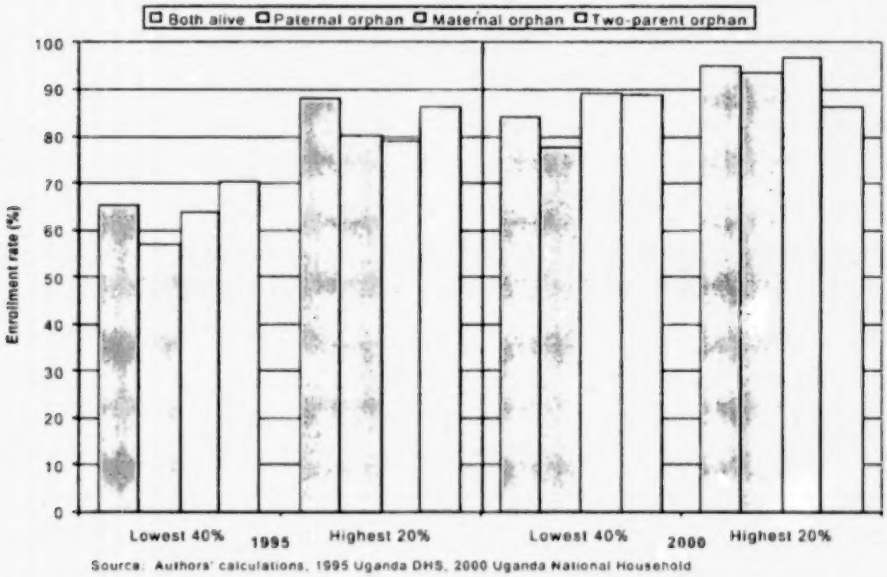
Figure 15. Enrollment rate by orphans status in lowest and highest quintiles, Zambia 1998



Source: Authors' calculations, 1998 Zambia Living Conditions Monitoring Survey

The large differentials between poor and non-poor enrollments in many countries suggest that policies to raise enrollment among the poor will have a large impact on the most disadvantaged orphans. This can be seen most clearly by the case of Uganda, where we have surveys from both 1995 and 2000 (Figure 16). In 1995, there was a roughly 20 percent differential between the poor and the non-poor in enrollment. In 1997, the government launched a large scale "universal enrollment" program that included the abolishing of fees for primary school that resulted in a surge in enrollments, particularly among the poor. By 2000, enrollment among the poor—including orphans—had increased by roughly 20 percentage points, reducing this gap (this result is explored in Deininger, Crommelynck and Kempaka 2001). There has been a similar large increase in enrollment of the poor in the Dominican Republic, which could be due to specific school policies or simply to growth in incomes among the poor (see Appendix 5). In Tanzania, enrollment of two-parent orphans has risen among the poor to the same low level as other poor children, eliminating orphan differentials. However, the large gap between all poor and non-poor children persists.

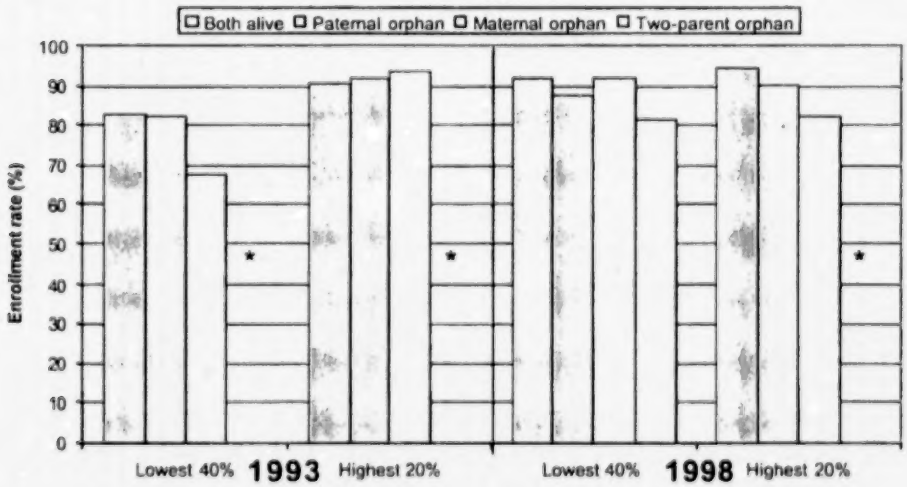
Figure 16. Changes in enrollment rate by orphan status and household wealth, Uganda 1995-2000



Source: Authors' calculations, 1995 Uganda DHS, 2000 Uganda National Household

In contrast, in countries like Kenya enrollment differentials according to household wealth are small (Figure 17). Yet within the poorest and richest households, enrollment does differ according to orphan status. Reducing poor-non-poor disparities in enrollment in Kenya is unlikely to raise orphan enrollment by much. This finding suggests that addressing issues related to specific problems faced by orphans in schools may help to further reduce enrollment disparities.

Figure 17. Changes in enrollment rate by orphan status and household wealth, Kenya 1993-98



Source: Authors' calculations, Demographic and Health Surveys.
* <20 two-parent orphans in this wealth category.

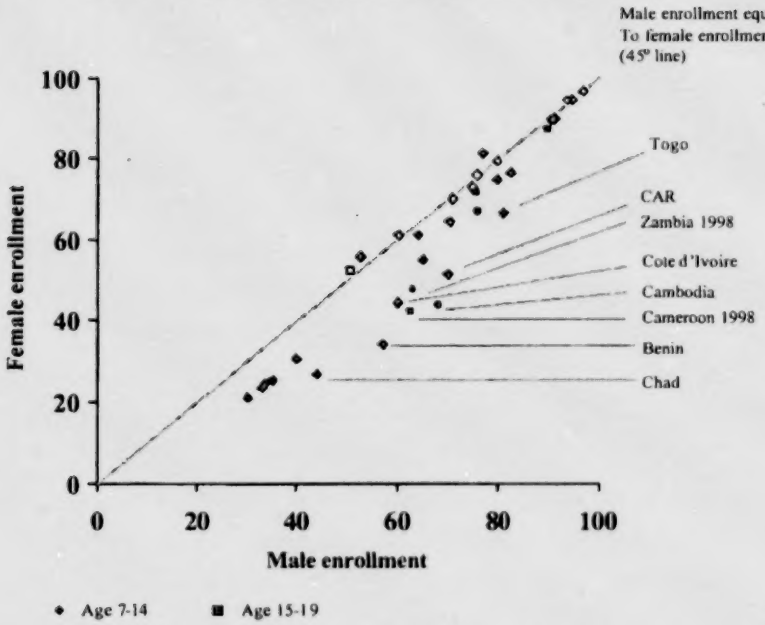
Finally, in seven countries enrollment data for orphans and non-orphans is available for children aged 15-17—four in Africa (Cameroon, South Africa, Uganda, and Zambia), two in Central America/Caribbean (Dominican Republic and Nicaragua) and Cambodia (Appendix 6). Enrollment rates for these age groups are generally lower than for children 7-14, but still demonstrate diversity in terms of enrollment differentials for orphans and non-orphans. All orphans are significantly less likely to be enrolled in Cameroon (1998), certain categories of orphan are under-enrolled in the Dominican Republic (1997), Nicaragua (1996), and Cambodia (1999), and there are no significant differences between the enrollment of orphans and non-orphans in South Africa (1998), Uganda (2000), and Zambia (1998). It appears that the orphan enrollment inequalities among 15-17 year olds in Cameroon can be largely explained by large gaps in enrollment between the poor and the non-poor, while the lack of orphan enrollment inequities in Uganda also reflects similar enrollment rates among the poor and the non-poor. Nicaragua, in contrast, has both high differentials among the poor and non-poor and, within each welfare group, lower enrollment among orphans than non-orphans.

Is the gender gap in enrollment larger for orphans?

There is a frequently voiced concern that the schooling of girls who are orphaned may suffer more than the schooling of boys who are orphaned, exacerbating existing inequalities in male-female enrollment rates (Subbarao, Mattimore, and Plangemann 2001, World Bank 2002a). There are a variety of reasons why the school enrollment of orphaned girls might be more affected than that of boys, including increased responsibilities in caring for siblings and higher demand for their time in household chores following the loss of an adult (if females are specialized in these tasks).

Before considering the gap among orphans, it is important to note that in many countries there are significant gaps in enrollment between boys and girls overall, including among children with living parents. Figure 18 shows a scatter-plot of the enrollment of girls against the enrollment of boys, regardless of orphan status. Children 7-14 are plotted as circles and children aged 15-17 are plotted as squares. Symbols that are solid indicate that the difference in male and female enrollment is statistically significantly different at the 10 percent level. A 45-degree line is drawn to indicate where male and female enrollment rates are the same; above the line girls have higher enrollment and below the line boys have higher enrollment. In countries where boys' enrollment is relatively high (over 75 percent), girls' enrollment is typically high as well and the differences that are statistically significant are small in magnitude. Togo is the exception, with boys' enrollment at 81 percent and girls' at 66 percent. Among countries with boys' enrollment rates between 50 and 75 percent, girls have substantially lower enrollment among 15 to 19 year olds but typically no lower enrollment among 7 to 14 year olds. An exception is the Central African Republic (CAR), where boys' enrollment is 70 percent among those 7 to 14 compared to 52 percent among girls. Last, among countries with boys' enrollment below 50 percent there appears to be a consistent shortfall of about 9 percentage points among girls, and an even greater gap in some cases (e.g., 17 percentage points in Chad).

Figure 18. The gender gap in enrollment, all children

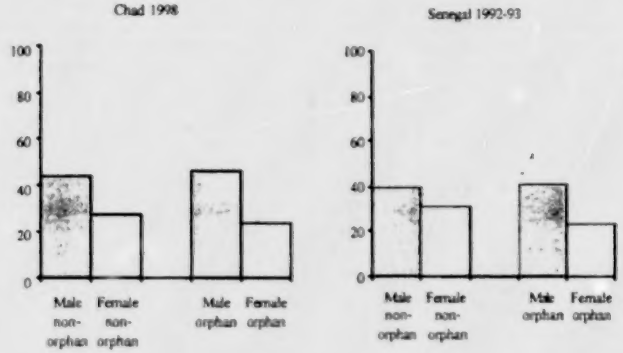


Solid symbol indicates that the male-female gap significant at 10 percent level

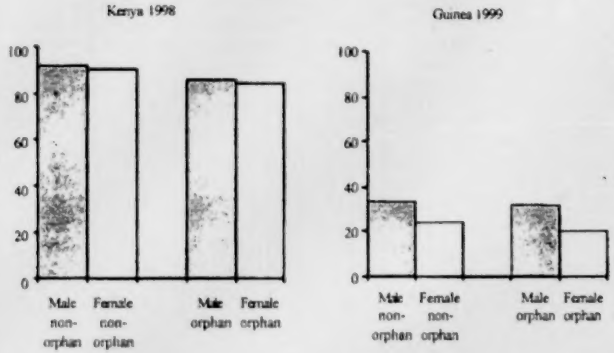
Is the gender gap in enrollment—usually a disadvantage for girls —greater for orphans than for non-orphans? Analysis of the data from these 28 countries shows that the answer to this question is not generalizeable (Appendix 7). There are four different categories of countries (Figure 19). First are countries like Chad and Senegal, where girls have lower enrollment and the gender gap between boys and girls is worse among orphans than among non-orphans (Panel A). Second is the more typical case, in which the gender gap in enrollment —be it at a low level (e.g., Kenya) or at a high level (e.g., Guinea)—is similar for orphans and non-orphans (Panel B). Twenty-one of the 28 countries had similar gender gaps for orphans and non-orphans among children 7-14 and all seven for which there were data for children 15-17 had similar gender gaps for orphans and non-orphans. A third category of countries has a *smaller* gender gap in enrollment among orphans than non-orphans (e.g. Burkina Faso and Nigeria, Panel C). A fourth category includes several countries where female orphans have *higher* enrollment than male orphans, while among non-orphans this is not the case (e.g., Tanzania and Nicaragua, Panel D).

Figure 19. The gender gap in enrollment among orphans and non-orphans, selected countries (ages 7-14)

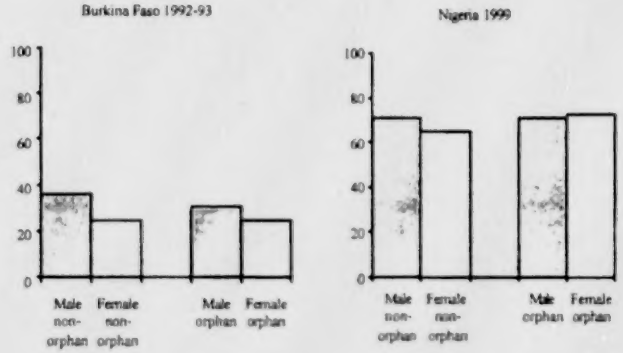
A. Female disadvantage in enrollment is larger among orphans than non-orphans



B. Male-female difference in enrollment is similar among orphans and non-orphans



C. Other scenarios – e.g. the male-female difference in enrollment is smaller among among orphans than non-orphans



D. Other scenarios - a female "advantage" among non-orphans which decreases or increases among orphans

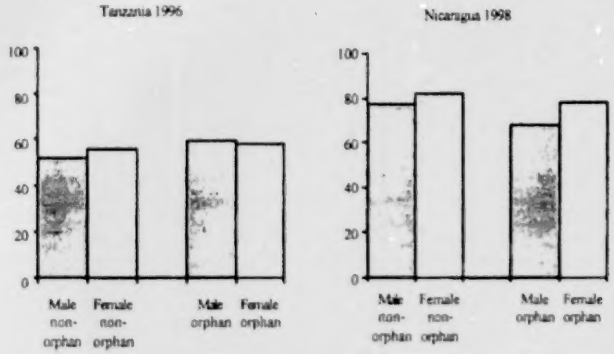
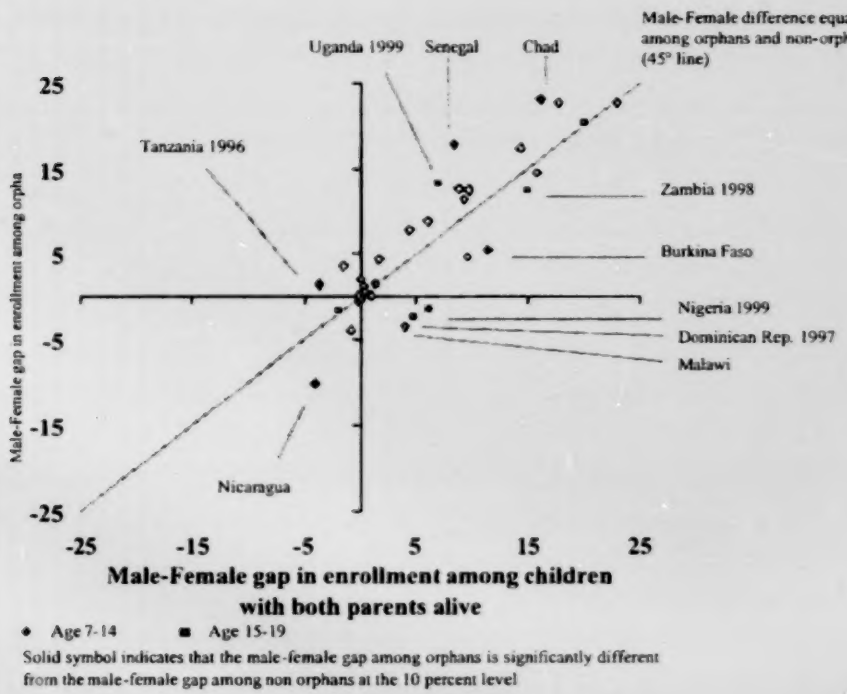


Figure 20 plots of the gender difference in enrollment among orphans (maternal, paternal, and both parent) on the Y-axis against the gender difference in enrollment among non-orphans on the X-axis. Differences that are statistically significant from zero are again shown using a solid symbol. Most countries correspond to the second category described above where girls are disadvantaged but the gender differential in enrollment among orphans mirrors that among non-orphans. There are only three countries in which female orphans have a disadvantage in enrollment that is greater for orphans than among non-orphans and in which this gap is significantly different from zero: Chad and Senegal for children aged 7 to 14, and Uganda for children aged 15 to 19.[11] In Burkina Faso (for 7-14 year olds) and Zambia (for 15-19 year olds) the gender gap among is significantly smaller among orphans than among non-orphans, and in three other countries a female disadvantage in enrollment among non-orphans becomes a female advantage among orphans (Nigeria and Malawi among 7 to 14 year olds, and Dominican Republic among 15 year olds). Last, in Tanzania a female *advantage* in enrollment among non-orphans becomes a *disadvantage* among orphans and in Nicaragua a female advantage is larger among orphans than non-orphans.[12]

Figure 20. Gender differences in enrollment, orphans and non-orphans compared

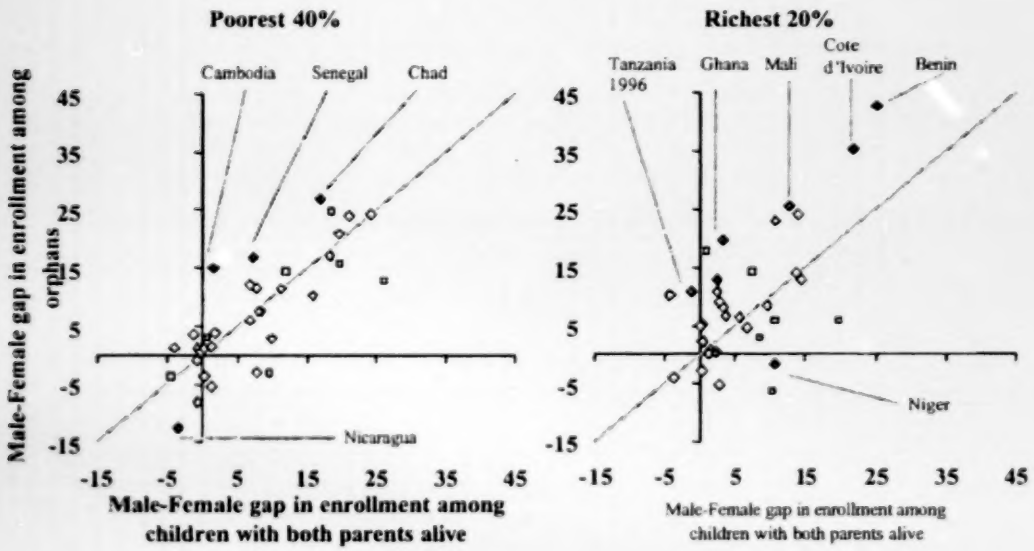


11. The difference in gender gap between orphans and non-orphans is also statistically significant in Cameroon, although the magnitude of the difference is extremely small.

12. In Nicaragua a female advantage among non-orphans is significantly reduced, although the magnitudes are miniscule.

While the results so far suggest that there is very little consistency across countries with respect to the relationship between orphan status and the gender gap in enrollment, it is possible that the differential would only manifest itself among poorer households. This would be the case if girls from poor households were especially likely to need to take care of their orphaned siblings, for example. Figure 21 plots the gender gap in enrollment between orphans and non-orphans according to whether the child is from a household in the poorest 40 percent, or the richest 20 percent of the sample. The results for the poorest 40 percent are similar to the overall sample. Chad and Senegal have a female disadvantage among the poor that is significantly larger for poor orphans, and Nicaragua has a female advantage among poor non-orphans that is larger among poor orphans. All the other the differences that were significant in the sample as a whole no longer are when focused on the poorest. Conversely, in Cambodia there was not a significant difference in the gender gap between orphans and non-orphans in the overall sample but there is a female disadvantage among non-orphans that is significantly (and substantially) larger among poor orphans. Interestingly, there are several countries where a female disadvantage among non-orphans is statistically significantly larger among orphans among children from the richest 20 percent of households: Benin, Côte d'Ivoire, Mali, Ghana, and Cameroon.

Figure 21. Gender gap in enrollment for orphans and non-orphans in the poorest and richest households



◆ Age 7-14 ■ Age 15-19

Solid symbol indicates that the male-female gap among orphans is significantly different from the male-female gap among non orphans at the 10 percent level

4. Conclusions

These diverse findings demonstrate that the extent to which orphans are under-enrolled relative to other children is country-specific, at least in part because the correlation between orphan status and poverty is not consistent across countries. Indeed, it cannot be assumed that enrollment differentials exist between orphans and non-orphans or, when they exist, why. On the other hand, all but a handful of the countries studied have sharp differentials in enrollment between children in poor and non-poor households and several have very low enrollments for both poor and non-poor children. Social protection and schooling policies need to take a close look at the specific situation in a country before considering mitigation measures.

- In countries like Benin, Burkina Faso, Guinea, and Senegal, the extent of under-enrollment of orphans is dwarfed by the enormous shortfall in overall enrollment evident among poor and non-poor children alike. This suggests that the key to raising enrollment among orphans is to pursue sectoral and economic policies to raise enrollment among all children, including orphans.
- In the group of countries with moderate overall enrollment rates there are often very large gaps between enrollment of poor and non-poor children. The most disadvantaged children are the poor, including poor orphans. Policies to reduce the gap in enrollment between poor and non-poor will contribute significantly to raising enrollment among the neediest orphans without any orphan-specific targeting. As was shown, in the Dominican Republic, Kenya, and Uganda, improvements in enrollments among the poor through rises in income or specific policies to improve the access of the poor have substantially raised the enrollment of orphans.
- In countries like Brazil, Dominican Republic, and Zimbabwe where overall enrollment rates are high even among the poor, lower enrollment of orphans is likely related to problems specific to being an orphan, some of which may not be school-related. The reasons for persistent enrollment gaps need to be carefully explored? policies that subsidize fees or school uniforms may not be effective in reducing this gap while potentially transferring funds to orphans who might otherwise already be enrolled.

The diversity of conditions dictates mitigation measures that are tailored to the needs of specific countries; policymakers need to resist the temptation to advocate a single 'best practice' model for all countries regardless of the extent or source of orphan enrollment differentials.

A more general conclusion from this study is that orphan status in most countries (there are some exceptions) is not good targeting criterion for "traditional" programs aimed at raising enrollment rates? like subsidies for school fees, text books, and uniforms. Orphans are not universally in need of assistance. Further, opportunistic redistribution of orphans is likely to occur when the benefits being channeled to orphans are things that other children or other household members lack? like textbooks, uniforms, school fees, free medical care, or supplemental feeding. Indeed, in much of Africa there is a strong tradition of redistributing children across households through child fostering (Ainsworth 1996). A concentration of orphans in some households could result from orphan targeting that may or may not result in

their improved welfare. On the other hand, interventions linked solely to the special needs of orphans (for example, grief counseling or health services for HIV-infected children) are unlikely to create incentives for opportunistic responses by households, as the benefits are not easily shared by other household members. Polic ies and programs aimed at improving the welfare of the poorest households will help the poorest children, including the poorest orphans, without creating incentives to redistribute children in ways that may adversely affect their welfare.

This analysis has focused on enrollments, which is a necessary but not sufficient condition for learning. The objective of "Education for All" is learning. We have not been able to explore delayed enrollment, completion rates, and the determinants of learning outcomes for orphans, the poor, and poor orphans—a high priority for research. Equally if not more important is greater research on the reasons why differences in enrollment among orphans and non-orphans persist and pilot field tests of alternative mitigation measures. In fact, child schooling may be affected *before* a parent dies, during the time when there is a sick adult who must be cared for and for whom many resources may be spent for medical treatment. By focusing exclusively on orphans—after a parental death—researchers may be neglecting the largest impacts, and those that may be amenable through short-term support for households with terminally ill adults.[13] Thus, the impacts on child schooling before parents and other adults die of AIDS are also a high priority for research.

Finally, while we have focused on the impact of orphan status on enrollment, we shouldn't lose sight of the fact that Education for All is a major policy to reduce the spread of HIV/AIDS. There is a well-established positive correlation between educational attainment and safer sexual behavior, which will translate into lower rates of new infection. Further, schools are an important point for providing information on HIV prevention. In many of the hardest-hit countries, young adults still have shockingly low levels of knowledge of how HIV is transmitted. In many of the countries studied, policies to raise enrollments among the poor will both raise enrollment among orphans and ensure that more poor children are given the tools to prevent HIV as they transition to adulthood.

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13. Gilborn and others (2001) found that enrollment of two-parent orphans and of children of people living with HIV/AIDS exceeded 90 percent in Uganda, but that older children (13-17) in households with a sick parent had lower school attendance (80 percent) than orphans (89 percent). Roughly one fourth of the children of people living with HIV/AIDS reported a decline in attendance and performance because of their parents' illness. Older two-parent orphans reported that their attendance improved after moving in with a guardian following the parent's death.

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Appendix 1. Data sets and sample sizes

Country	*Survey*	*Year*	*Number of children 7-14*	*Number of paternal orphans*	*Number of maternal orphans*	*Number of 2-parent orphans*
Benin	DHS	1996	6,455	393	226	36
Brazil	DHS	1996	10,601	550	129	47
Burkina Faso	DHS	1992/3	7,933	537	267	139
Cambodia	SES	1999	7,463	399	87	69
Cameroon	DHS	1991	4,391	293	118	32
Cameroon	DHS	1998	5,835	513	189	58
Central African Rep.	DHS	1994/5	5,996	576	277	90
Chad	DHS	1996/7	8,459	639	237	86
Côte d'Ivoire	DHS	1994	8,497	512	209	57
Dominican Republic	DHS	1991	6,684	221	135	17
Dominican Republic	DHS	1996	7,504	294	162	16
Ghana	DHS	1993	5,156	292	135	76
Ghana	DHS	1998	5,131	277	149	37
Guatemala	DHS	1999	6,760	360	169	23
Guinea	DHS	1999	8,202	564	246	112
Haiti	DHS	1994/5	5,242	461	252	115
Kenya	DHS	1993	9,705	649	200	43
Kenya	DHS	1998	9,159	814	219	119
Madagascar	DHS	1997	7,127	525	295	55
Malawi	DHS	1992	5,924	626	311	75
Mali	DHS	1995/6	11,298	362	250	75
Mozambique	DHS	1997	10,257	1054	665	165
Nicaragua	DHS	1997/8	14,276	690	177	36
Niger	DHS	1998	8,194	460	259	36
Nigeria	DHS	1999	8,136	360	225	94
Senegal	DHS	1992/3	7,103	407	194	33
South Africa	OHS	1995	24,559	2,861	383	402
South Africa	OHS	1998	15,927	1,667	299	174
Tanzania	DHS	1991/2	10,189	695	306	67
Tanzania	DHS	1996	8,660	671	305	80
Togo	DHS	1998	11,176	989	402	104
Uganda	DHS	1995	8,131	967	405	287
Uganda	UNHS	1999/0	15,359	1,765	675	781
Zambia	DHS	1992	7,773	563	252	87
Zambia	DHS	1996/7	8,881	901	384	217
Zambia	LCMS	1996	13,248	1,355	488	329
Zambia	LCMS	1998	20,830	2,194	687	748
Zimbabwe	DHS	1994	7,345	624	198	80
Zimbabwe	DHS	1999	6,783	841	242	201

Source: DHS: Demographic and Health Survey; LCMS: Living Conditions Measurement Survey; OHS: October Household Survey; SES: Socio-Economic Survey; UNHS: Uganda National Household Survey.

Appendix 2A. Orphan rates, ages 7-14

Country	*Year*	*Paternal orphans*	*Maternal orphans*	*Two-parent orphans*	*Missing*
Benin DHS	1993	6.15	3.41	0.54	1.17
Brazil DHS	1996	5.10	1.23	0.42	2.43
Burkina Faso DHS	1993	6.37	3.52	1.62	0.63
Cambodia SES	1999	5.18	1.10	0.89	2.15
Cameroon DHS	1991	6.66	2.84	0.75	1.49
Cameroon DHS	1998	8.87	3.58	0.99	2.16
Central African Rep. DHS	1994	9.62	4.60	1.53	1.35
Chad DHS	1996	7.25	2.93	0.87	1.61
Côte d'Ivoire DHS	1994	5.88	2.47	0.68	1.63
Dominican Republic DHS	1991	3.54	1.67	0.27	1.88
Dominican Republic DHS	1996	3.73	2.09	0.19	0.24
Ghana DHS	1993	5.65	2.63	1.48	1.25
Ghana DHS	1998	5.10	2.84	0.70	1.20
Guatemala DHS	1999	5.02	2.44	0.35	2.42
Guinea DHS	1999	6.88	3.02	1.32	2.30
Haiti DHS	1993	8.56	4.91	2.06	1.64
Kenya DHS	1993	6.60	1.99	0.38	3.13
Kenya DHS	1998	8.77	2.45	1.26	2.91
Madagascar DHS	1997	7.60	4.37	0.79	2.59
Malawi DHS	1992	6.07	4.23	1.58	1.24
Mali DHS	1995	5.15	2.64	0.67	0.86
Mozambique DHS	1997	9.66	6.74	1.78	3.10
Nicaragua DHS	1997	4.75	1.19	0.26	0.68
Niger DHS	1998	5.25	3.20	0.40	1.99
Nigeria DHS	1999	4.31	2.74	1.16	7.00
Nigeria DHS^	1999	4.63	2.95	1.24	-
Senegal DHS	1993	5.71	2.72	0.47	2.71
South Africa OHS	1995	12.48	1.63	1.64	n/a
South Africa OHS	1998	10.61	1.80	0.97	3.98
Tanzania DHS	1991	6.66	2.91	0.81	3.60
Tanzania DHS	1996	8.04	3.68	1.01	2.22
Togo DHS	1998	8.87	3.42	0.99	0.94
Uganda DHS	1995	11.87	4.89	3.26	2.32
Uganda NHS	1999/00	11.10	4.06	4.54	0.22
Zambia DHS	1992	7.17	3.25	1.07	1.24
Zambia DHS	1996	10.58	4.34	2.57	1.99
Zambia LCMS	1996	10.41	3.60	2.42	2.33
Zambia LCMS	1998	10.75	3.44	3.54	1.03
Zimbabwe DHS	1994	8.75	2.63	1.10	2.61
Zimbabwe DHS	1999	12.59	3.67	3.11	4.37

^ Percentages omitting missing orphan status category.

Appendix 2B. Orphan rates, ages 15-17

Country	*Year*	*Paternal orphans*	*Maternal orphans*	*Two-parent orphans*	*Missing*
Cambodia SES	1999	8.34	1.75	1.72	3.37
Cameroon DHS	1998	13.20	4.74	2.02	1.81
Dominican Republic DHS	1996	5.27	3.02	0.59	0.46
Nicaragua DHS	1997	7.58	2.18	0.66	0.76
South Africa OHS	1995	15.48	2.08	2.48	n/a
South Africa OHS	1998	14.71	2.41	1.61	3.37
Uganda NHS	1999/00	15.18	5.13	6.51	0.19
Zambia LCMS	1996	14.03	4.39	3.59	5.67
Zambia LCMS	1998	14.53	4.80	5.27	1.46

Appendix 3. Relationship to head among two-parent orphans, ages 7-14

Country/data set/year	*Head*	*Grandchild*	*Sibling*	*Adopted/ foster child*[a]	*Other Relation (including spouse, in-law, niece, nephew, etc.)*	*No relation*
Benin DHS 1993	0.0	11.6	13.8	6.2	52.2	16.3
Brazil DHS 1996	0.0	23.2	4.1	36.9	21.9[b]	13.9
Burkina Faso DHS 1993	0.0	27.3	11.0	17.1	39.1	5.5
Cambodia SES 1999	0.0	37.0	14.0	27.4	21.1	0.6
Cameroon DHS 1991	0.0	10.4	22.8	..	48.9	18.0
Cameroon DHS 1998	0.0	21.1	22.1	3.0	46.7	7.2
C.A.R. DHS 1994	0.0	16.5	19.3	3.0	57.1	4.1
Chad DHS 1996	0.8	13.9	9.1	18.2	57.5	0.7
Côte d'Ivoire DHS 1994	0.0	16.4	10.2	0.0	65.8	7.6
Dominican Rep. DHS 1991	0.0	23.1	12.9	15.1	35.4	13.5
Dominican Rep. DHS 1996	0.0	38.5	28.5	12.9	15.3	4.9
Ghana DHS 1993	0.0	37.7	7.8	6.5	44.2	3.9
Ghana DHS 1998	0.0	29.7	8.1	11.5	44.2	6.5
Guatemala DHS 1999	0.0	60.8	3.5	1.3	13.1	21.2
Guinea DHS 1999	0.8	13.9	18.2	31.8	30.7	4.6
Haiti DHS 1997	0.0	28.5	5.5	3.6	36.6	25.9
Kenya DHS 1993	0.0	37.8	13.2	9.5	35.6	3.9
Kenya DHS 1998	0.0	27.2	10.9	12.5	39.5	9.9
Madagascar DHS 1997	0.0	23.9	15.9	25.8	18.2	16.3
Malawi DHS 1997	0.0	54.8	9.7	14.0	11.1	10.4
Mali DHS 1996	0.0	10.2	13.9	36.3	31.1	8.5
Mozambique DHS 1997	0.0	15.2	20.8	5.8	57.3	0.9
Nicaragua DHS 1997	0.0	52.5	9.4	13.0	22.3	2.8
Niger DHS 1998	0.0	36.3	7.0	23.7	27.4	5.6
Nigeria DHS 1999	0.0	36.8	14.3	10.3	31.1	7.5
Senegal DHS 1993	0.0	6.1	3.0	12.1	66.7	12.1
South Africa, OHS 1995	0.0	46.3	10.2	21.9	17.5	4.1
Tanzania DHS 1991	0.0	38.9	13.0	4.4	41.3	2.4
Tanzania DHS 1996	0.0	35.4	13.0	0.6	46.0	5.0
Togo DHS 1998	0.0	30.5	11.2	14.6	34.3	9.4
Uganda DHS 1995	0.1	40.7	9.9	9.6	36.7	3.0
Zambia DHS 1992	0.0	27.5	17.4	2.2	51.3	1.7
Zambia DHS 1996	0.0	30.8	15.7	2.9	49.1	1.5
Zambia, LCMS 1996[c]	0.0	38.1	10.1	8.4	42.6	0.8
Zimbabwe DHS 1994	0.0	46.0	10.3	8.7	35.1	0.0
Zimbabwe DHS 1999	0.4	50.1	13.2	6.0	29.9	0.5

Notes: a. This category may include children who are related biologically to the head, including grandchildren, siblings, and other relatives. Depending on the country, the response may be adopted and/or fostered and/or stepchild.

b. Of which 11.3 percent are the niece or nephew of the head.

c. Ages 7-11.

Appendix 4. Enrollment rates by orphan status and household wealth, ages 7-14

		All children					*Poorest 40 percent*					*Richest 20 percent*				
Dataset	*Year*	*Both alive*	*Paternal orphans*	*Maternal orphans*	*Two-parent orphans*	*Total*	*Both alive*	*Paternal orphans*	*Maternal orphans*	*Two-parent orphans*	*Total*	*Both alive*	*Paternal orphans*	*Maternal orphans*	*Two-parent orphans*	*Total*
Benin DHS	1996	47.3	38.7**	37.9**	20.1**	46.0	27.3	24.0	21.8	#	26.5	74.3	48.6**	69.8	#	72.4**
Brazil DHS	1996	95.3	92.6*	85.5**	87.2	94.7	91.8	91.0	82.4+	91.7	91.1	99.0	97.6	#	#	98.7**
Burkina Faso DHS	1992/3	30.2	31.6	22.3**	25.5	29.9	15.7	12.1	15.9	18.0	15.6	67.5	63.3	61.1	46.1**	66.4**
Cambodia SES	1999	74.8	67.3*	68.7	69.0	74.1	64.9	61.1	64.3	54.1	64.1	91.6	94.4	#	#	91.1**
Cameroon DHS	1991	70.7	76.5*	69.3	66.0	71.2	52.0	58.8	43.0	#	52.3	93.6	92.0	92.4	#	93.3**
Cameroon DHS	1998	77.9	79.0	66.6**	72.5	77.5	62.1	66.2	56.2	60.9	62.4	94.6	91.0	94.4	#	94.3**
C.A.R. DHS	1994/5	63.2	53.1**	55.2*	46.5**	61.1	44.9	38.8	38.7	24.0*	42.9	86.2	73.4*	83.1	83.2	84.7**
Chad DHS	1996/7	35.6	36.7	32.6	33.8	35.5	24.4	24.5	14.3+	#	24.1	61.6	60.1	63.6	47.5	61.3**
Cote d'Ivoire DHS	1994	53.3	44.9**	44.1**	38.8*	52.3	36.0	27.6*	26.0+	#	35.1	77.0	58.0**	70.6	#	75.6**
Dominican Rep. DHS	1991	73.4	69.4	58.5*	#	72.6	56.5	54.7	37.0*	#	55.3	93.7	90.9	#	#	93.6**
Dominican Rep. DHS	1996	94.2	92.7	88.5+	#	94.0	90.2	84.5	82.4	#	89.7	97.8	99.5*	#	#	97.9**
Ghana DHS	1993	78.8	72.9*	77.0	68.4+	78.2	72.0	69.7	66.7	60.0	71.6	92.2	80.4+	91.7	#	91.5**
Ghana DHS	1998	80.7	68.9**	77.6	73.6	79.8	71.4	64.4	71.6	#	70.6	93.6	94.6	#	#	93.1**
Guatemala DHS	1999	80.6	73.8*	69.8*	74.4	79.7	69.5	67.0	57.6*	#	68.6	95.9	#	#	#	95.5**
Guinea DHS	1999	29.0	28.0	19.4**	31.1	28.3	14.8	12.7	13.1	10.9	14.2	54.7	45.4	49.2	67.1	53.3**
Haiti DHS	1994/5	77.2	77.7	64.3**	59.9**	76.0	60.2	55.1	50.7	44.4	58.5	92.1	92.4	72.2*	75.8*	90.5**
Kenya DHS	1993	84.3	83.5	77.9+	68+	83.8	82.7	82.5	67.6*	#	82.2	90.6	91.7	93.6	#	89.5**
Kenya DHS	1998	91.3	87.2**	84.2*	72.8**	90.4	91.6	87.5+	91.8	81.7	91.0	94.4	90.1	82.5	#	93.3+
Madagascar DHS	1997	62.9	53.1**	44.7**	40.6**	60.8	49.8	44.1	35.1*	34.2	48.2	92.7	83.5+	81.0	#	91.5**
Malawi DHS	1992	64.5	53.4**	50.8**	39.0**	62.6	53.1	42.2+	37.9*	61.2	51.6	85.3	81.2	71.2*	#	83.9**
Mali DHS	1995/6	29.1	30.0	26.0	24.3	29.0	12.5	10.2	12.4	0.9**	12.2	66.6	75.1+	72.2	47.0+	66.6**
Mozambique DHS	1997	61.4	59.6	63.8	32.1**	60.1	46.5	56.5*	52.3	25.8*	47.1	82.5	69.2*	88.4	65.0	80.9**
Nicaragua DHS	1997/8	79.5	73.5**	71.1*	73.4	79.1	65.7	61.0	56.0+	65.0	65.2	94.8	94.4	#	#	94.5**

(Continued on the next page.)

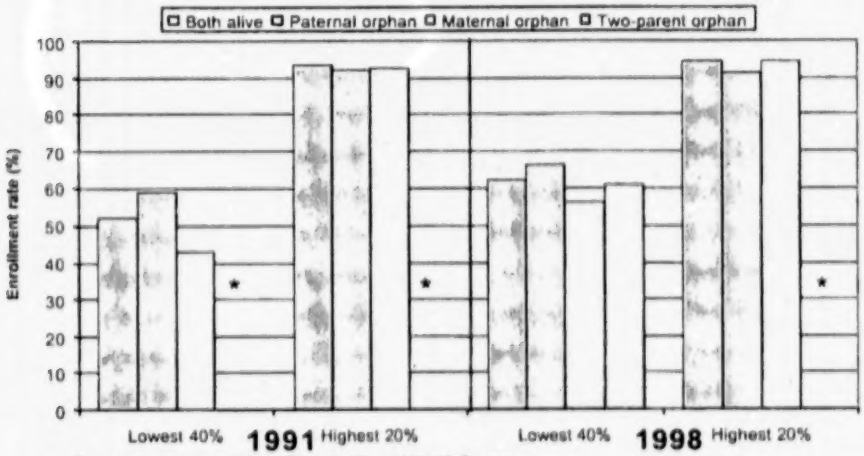
Appendix 4 (continued). Enrollment rates by orphan status and household wealth, ages 7-14

		All children					*Poorest 40 percent*					*Richest 20 percent*				
Dataset	*Year*	*Both alive*	*Paternal orphans*	*Maternal orphans*	*Two-parent orphans*	*Total*	*Both alive*	*Paternal orphans*	*Maternal orphans*	*Two-parent orphans*	*Total*	*Both alive*	*Paternal orphans*	*Maternal orphans*	*Two-parent orphans*	*Total*
Niger DHS	1998	26.3	23.6	22.2	22.1	25.7	13.7	9.1	10.2	#	13.1	61.4	53.4	46.2+	#	60.0**
Nigeria DHS	1999	67.8	73.7*	71.3	66.5	67.6	41.4	49.5	52.9+	53.7	42.0	93.7	93.1	82.3+	#	92.2**
South Africa OHS	1995	97.0	96.9	93.5*	95.7	96.9	95.8	96.4	93.7	96.4	95.9	99.1	97.8	95.7	97.1	98.9**
South Africa OHS	1998	93.3	92.8	95.3	90.6	93.2	92.1	92.4	96.4**	88.0	92.2	95.0	97.5	#	#	95.1**
Senegal DHS	1992/3	35.9	31.2*	39.2	9.1**	35.4	15.6	21.3+	20.2	#	15.8	72.0	57.1+	68.8	#	70.7**
Tanzania DHS	1991/2	53.2	56.6	53.9	37.9*	53.2	47.6	50.4	43.0	21.9**	47.7	65.6	74.5	76.4	#	65.6**
Tanzania DHS	1996	53.7	59.9**	56.2	60.7	54.3	44.8	56.3**	50.1	52.3	46.0	73.1	65.6	75.6	67.8	72.0**
Togo DHS	1998	75.1	69.7**	76.9	59.6**	74.2	63.9	64.3	63.8	42.7*	63.5	87.8	76.8+	96.2**	66.6*	86.7**
Uganda DHS	1995	74.9	66.7**	71.0	74.7	73.6	65.5	57.1*	64.0	70.6	64.4	88.2	80.3*	79.1*	86.3	86.2**
Uganda UNHS	1999/0	90.4	87.9+	92.5	88.4	90.1	84.2	77.6*	89.2	88.8	83.8	95.1	93.6	96.9	86.3+	94.3**
Zambia DHS	1992	77.8	72.0**	68.5**	77.0	76.9	61.3	58.8	57.3	69.5	60.7	95.7	93.7	91.1	#	95.3**
Zambia DHS	1996/7	68.6	62.0**	66.9	64.4	67.6	56.1	52.8	55.2	56.5	55.5	92.6	90.6	91.2	79.7*	91.9**
Zambia LCMS	1996	71.1	70.2	65.0+	71.8	70.6	56.7	60.1	57.6	38.8*	56.9	92.9	90.5	83.8*	87.0+	92.0**
Zambia LCMS	1998	68.7	69.2	65.9	58.7**	68.3	56.7	58.2	58.7	41.7**	56.4	91.9	89.2	82.4**	84.0*	91.0**
Zimbabwe DHS	1994	91.0	89.4	85.3*	94.4	90.6	88.7	84.8+	87.5	91.3	88.1	96.5	97.7	#	#	96.2**
Zimbabwe DHS	1999	90.0	88.4	85.5+	80.0**	89.1	88.6	85.7	80.1*	81.7+	87.5	96.6	99.3*	94.9	77.5+	96.1**

# indicates a cell size of fewer than 20 observations. All significance tests are carried out relative to the "Both alive" category within the wealth level, except for the "Total" column of the "richest 20 percent" level which is relative to the "Total" column for the "poorest 40 percent". + indicates significance at the 10 percent level, * indicates significance at the 5 percent level, and ** indicates significance at the 1 percent level.

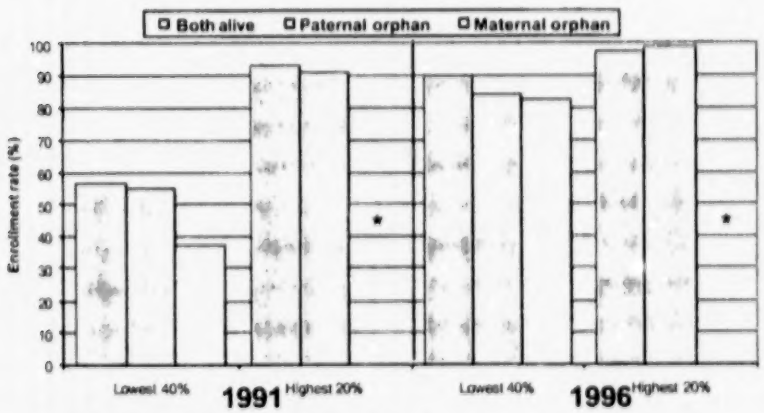
Appendix 5. Changes in enrollment over time, by orphan status and household welfare

Changes in enrollment rates by orphan status and household wealth, Cameroon 1991-98



Source: Authors' calculations, Demographic and Health Surveys
* < 20 two-parent orphans in this wealth category

Changes in enrollment rate by orphan status and household wealth, Dominican Republic 1991-96



Source: Authors' calculations, Demographic and Health Surveys
* < 20 children were maternal orphans in the highest 20% or 2-parent orphans in all wealth categories.

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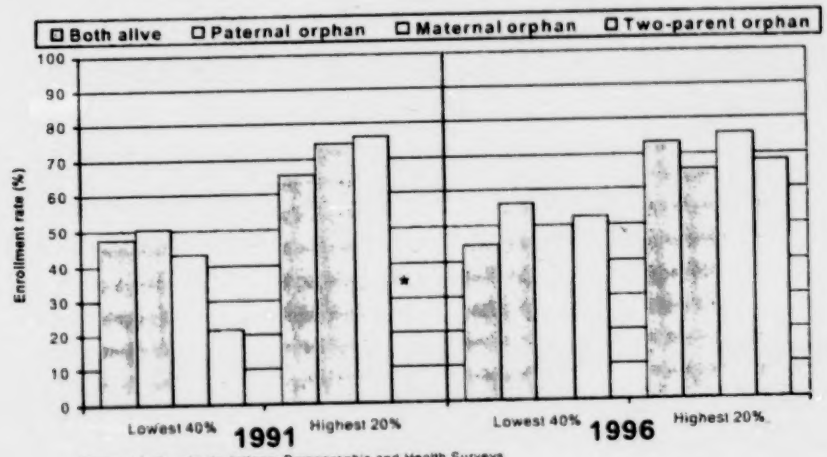
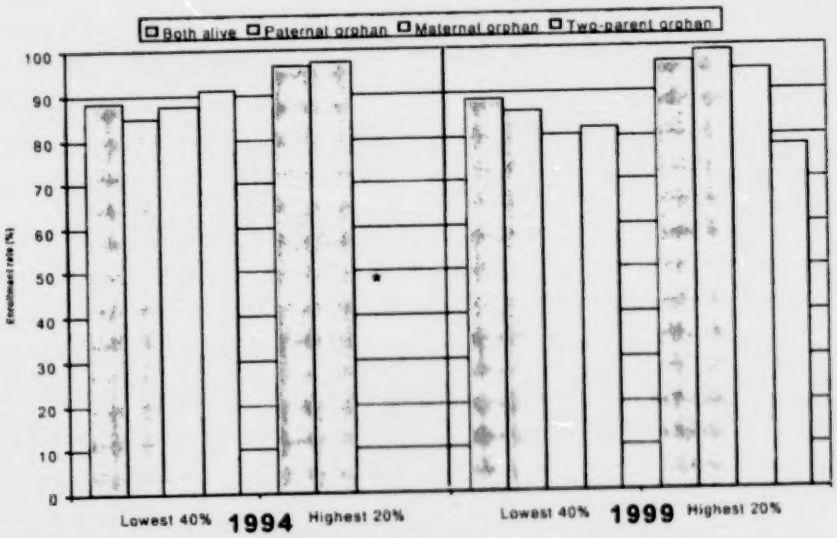
Changes in enrollment rates by orphan status and household wealth, Tanzania 1991-96



Source: Authors' calculations, Demographic and Health Surveys
* <20 two-parent orphans in the highest 20%

Changes in enrollment rate by orphan status and household wealth, Zimbabwe 1994-99



Source: Authors' calculations, Demographic and Health Surveys
* < 20 children were maternal or two-parent orphans in this wealth category

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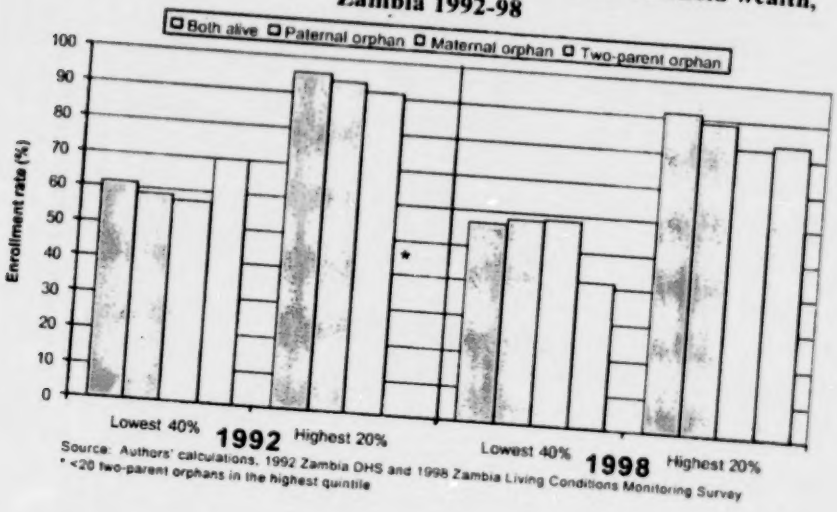
Changes in enrollment rate by orphan status and household wealth, Zambia 1992-98



Source: Authors' calculations, 1992 Zambia DHS and 1998 Zambia Living Conditions Monitoring Survey
* <20 two-parent orphans in the highest quintile

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Appendix 6. Enrollment rates by orphan status and household wealth, ages 15-17

	All children				*Poorest quintile*				*Richest quintile*			
Country	*Both alive*	*Paternal orphans*	*Maternal orphans*	*Two-parent orphans*	*Both alive*	*Paternal orphans*	*Maternal orphans*	*Two-parent orphans*	*Both alive*	*Paternal orphans*	*Maternal orphans*	*Two-parent orphans*
Cameroon DHS 1998	54.9	46.5*	40.8*	26.3**	33.1	29.5	#	#	75.5	70.7	#	#
Dominican Rep. DHS 1997	75.2	62.9**	64.2+	43.4+	60.9	32.3**	35.3*	#	81.8	#	#	#
Nicaragua DHS 1996	53.1	43.6**	31.0**	29.7*	18.8	18.1	#	#	82.1	60.6**	#	#
Cambodia SES 1999	57.4	43.5**	55.4	43.9	42.8	30.4+	#	#	70.9	74.2	#	#
Zambia LCMS 1996	60.8	53.9*	58.4	49.3*	40.4	38.4	65.9*	25.3	81.5	77.2	75.2	69.8+
Zambia LCMS 1998	56.2	53.3	54.1	52.8	45.5	43.3	34.0	34.1	80.4	79.9	70.9	72.1
South Africa OHS 1995	92.7	89.3**	86.9*	83.1**	89.9	86.0+	87.4	74.9*	96.2	92.7	#	#
South Africa OHS 1998	89.5	86.1*		85.7	88.5	79.9**	77.2+	78.9	92.4	85.2	#	#
Uganda UNHS 1999/00	74.1	64.8**	71.6	61.8*	61.1	58.8	52.3	66.7	79.0	70.7	81.1	66.9+

# indicates a cell size of fewer than 20 observations. All significance tests are whether the enrollment for females is different from males, within the orphan status group. + indicates significance at the 10 percent level, * indicates significance at the 5 percent level, and ** indicates significance at the 1 percent level.

Appendix 7. School enrollment by orphan status and gender, ages 7-14

		Both alive			*Paternal orphans*			*Maternal orphans*			*Two-parent orphans*			*Total*		
Data set	*Year*	*Male*	*Female*	*Total*	*Male*	*Female*	*Total*	*Male*	*Female*	*Total*	*Male*	*Female*	*Total*	*Male*	*Female*	*Total*
Benin DHS	1996	58.3	35.6**	47.3	49.6	28.5**	38.7	48.1	23.3**	37.9	#	10.1	20.1	57.1	34.3**	46.0
Brazil DHS	1996	95.3	95.3	95.3	92.1	93.0	92.6	84.6	86.4	85.5	#	83.0	87.2	94.6	94.7	94.7
Burkina Faso DHS	1992/3	35.9	24.5**	30.2	33.8	29.3	31.6	24.8	19.4	22.3	31.5	21.0	25.5	35.3	25.5**	29.9
Cambodia SES	1999	75.8	73.8+	74.8	71.1	63.0	67.3	63.0	77.1	68.7	70.9	66.6	69.0	74.9	73.1	74.1
Cameroon DHS	1991	74.5	67.0**	70.7	77.6	75.2	76.5	76.0	62.3	69.3	#	#	66.0	74.8	67.7**	71.2
Cameroon DHS	1998	80.0	75.7*	77.9	84.0	73.5*	79.0	66.3	67.0	66.6	80.6	65.9	72.5	79.9	75.0**	77.5
C.A.R. DHS	1994/5	71.7	54.1**	63.2	62.6	43.0**	53.1	69.0	40.3**	55.2	59.3	36.3*	46.5	70.1	51.5**	61.1
Chad DHS	1996/7	43.7	27.5**	35.6	47.6	25.8**	36.7	44.9	18.9**	32.6	45.6	19.4*	33.8	44.0	26.9**	35.5
Cote d'Ivoire DHS	1994	61.4	45.3**	53.3	53.8	36.9**	44.9	49.9	38.8+	44.1	42.1	35.9	38.8	60.2	44.4**	52.3
Dominican Rep. DHS	1991	69.7	77.1**	73.4	66.1	72.8	69.4	57.4	59.8	58.5	#	#	#	69.0	76.3**	72.6
Dominican Rep. DHS	1996	93.8	94.7	94.2	91.2	94.3	92.7	85.5	91.3	88.5	#	#	#	93.5	94.5	94.0
Ghana DHS	1993	81.4	76.0**	78.8	78.0	67.9+	72.9	81.2	70.9	77.0	67.6	69.2	68.4	81.0	75.2**	78.2
Ghana DHS	1998	80.7	80.7	80.7	67.9	69.9	68.9	78.3	76.9	77.6	83.6	#	73.6	79.9	79.6	79.8
Guatemala DHS	1999	83.5	77.6**	80.6	75.1	72.4	73.8	82.1	58.3*	69.8	#	#	74.4	82.7	76.5**	79.7
Guinea DHS	1999	33.6	24.4**	29.0	33.5	21.8**	28.0	28.9	11.2**	19.4	27.1	35.2	31.1	33.1	23.5**	28.3
Haiti DHS	1994/5	77.3	77.1	77.2	75.6	79.9	77.7	71.1	58.4+	64.3	51.1	68.2+	59.9	75.9	76.0	76.0
Kenya DHS	1993	84.7	83.8	84.3	85.7	81.6	83.5	77.6	78.2	77.9	63.1	74.7	68.0	84.3	83.3	83.8
Kenya DHS	1998	91.9	90.7	91.3	87.5	86.9	87.2	82.9	85.4	84.2	80.1	68.1	72.8	91.1	89.7+	90.4
Madagascar DHS	1997	62.0	63.9	62.9	53.9	52.3	53.1	47.8	41.7	44.7	43.9	37.2	40.6	60.4	61.3	60.8
Malawi DHS	1992	66.6	62.6*	64.5	54.7	52.3	53.4	48.3	53.8	50.8	33.4	47.1	39.0	64.2	61.2+	62.6
Mali DHS	1995/6	33.6	24.8**	29.1	38.3	22.8**	30.0	33.0	19.5**	26.0	15.0	30.2	24.3	33.7	24.5**	29.0
Mozambique DHS	1997	65.7	57.1**	61.4	66.9	51.3*	59.6	69.6	58.4+	63.8	33.0	31.0	32.1	65.2	55.0**	60.1
Nicaragua DHS	1997/8	77.5	81.5**	79.5	67.3	79.2**	73.5	69.0	73.0	71.1	71.6	#	73.4	76.9	81.3**	79.1

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Appendix 7 (continued). School enrollment by orphan status and gender ages 7-14

		Both alive			*Paternal orphans*			*Maternal orphans*			*Two-parent orphans*			*Total*		
Data set	*Year*	*Male*	*Female*	*Total*	*Male*	*Female*	*Total*	*Male*	*Female*	*Total*	*Male*	*Female*	*Total*	*Male*	*Female*	*Total*
Niger DHS	1998	31.0	21.4**	26.3	24.6	22.5	23.6	26.9	17.1**	22.2	#	#	22.1	30.1	21.0**	25.7
Nigeria DHS	1999	70.7	64.6**	67.8	71.8	75.9	73.7	75.3	65.0	71.3	55.1	75.0+	66.5	70.3	64.5**	67.6
South Africa OHS	1995	97.1	97.0	97.0	96.7	97.2	96.9	93.0	94.1	93.5	96.5	94.9	95.7	97.0	96.9	96.9
South Africa OHS	1998	92.6	93.9*	93.3	92.8	92.7	92.8	93.5	96.9	95.3	93.2	88.1	90.6	92.6	93.7*	93.2
Senegal DHS	1992/3	40.1	31.7**	35.9	41.6	20.2**	31.2	44.5	32.1**	39.2	#	#	9.1	39.9	30.7**	35.4
Tanzania DHS	1991/2	52.7	53.6	53.2	56.1	57.1	56.6	54.3	53.3	53.9	36.3	39.6	37.9	52.8	53.6	53.2
Tanzania DHS	1996	52.1	55.4**	53.7	61.3	58.6	59.9	57.3	55.0	56.2	55.0	66.0	60.7	52.7	55.8*	54.3
Togo DHS	1998	81.7	67.7**	75.1	77.7	60.7**	69.7	85.0	66.9**	76.9	67.5	48.2+	59.6	81.1	66.5**	74.2
Uganda DHS	1995	77.3	72.5**	74.9	70.5	63.0*	66.7	73.4	68.0	71.0	77.3	72.1	74.7	76.1	71.2**	73.6
Uganda UNHS	1999/0	90.9	89.9	90.4	87.6	88.2	87.9	94.4	90.6	92.5	87.9	89.0	88.4	90.5	89.6	90.1
Zambia DHS	1992	78.2	77.5	77.8	69.1	74.4	72.0	71.9	65.1	68.5	79.5	75.0	77.0	77.4	76.6	76.9
Zambia DHS	1996/7	68.8	68.4	68.6	60.0	64.5	62.0	64.0	70.2	66.9	64.5	64.2	64.4	67.4	67.8	67.6
Zambia LCMS	1996	71.0	71.1	71.1	74.0	66.42*	70.2	65.7	64.2	65.0	72.0	71.6	71.8	71.0	70.2	70.6
Zambia LCMS	1998	68.9	68.4	68.7	70.0	68.3	69.2	65.9	66.0	65.9	57.8	59.5	58.7	68.5	68.1	68.3
Zimbabwe DHS	1994	91.4	90.0	91.0	89.8	89.1	89.4	88.7	82.3	85.3	94.0	94.8	94.4	91.3	89.9+	90.6
Zimbabwe DHS	1999	90.1	89.9	90.0	88.7	88.0	88.4	87.6	83.8	85.5	82.4	78.0	80.0	89.4	88.9	89.1

# indicates a cell size of fewer than 20 observations. All significance tests are whether the enrollment for females is different from males, within the orphan status group. + indicates significance at the 10 percent level, * indicates significance at the 5 percent level, and ** indicates significance at the 1 percent level.

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